NATURE MAGAZINE

OCTOBER 1927 Vol. 10, No 4

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Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

MOUNTAIN goats and other wild life photographed, adventures among glaciers and snow-stopped passes and encounters with the elements have been reported by the members of the American Nature Association's Expedition led by Arthur Newton Pack into the upper reaches of Glacier National Park. By the time this issue of Nature Magazine is off the press the explorers will be almost home with the results of their work. In the December issue of Nature Magazine it will be possible to publish the first story of this expedition with pictures. It will be worth reading.

* * *

The American Nature Association's Outdoor Good Manners campaign goes on the year around. Below is printed one of the cartoons submitted in our recent cartoon contest. It is the work of one of the prize-winners in the professional class. Beside it is a particularly beautiful bit of outdoor good manners verse.

OH BOY, BUT THIS IS SOME DAY FOR AN OUTING
AN' BELIEVE ME WE'VE GOT SOME LUNCH
THIS'S LIFE, NO DISH WASHING OR MESS TO CLEAN UP!
HERE COMES TH' PUPPY WOOD
SUFFERIN' CATFISH, GIMME SOME MORE BAIT!
I KILLED 10 ROBINS AN' 6 THRASHERS WITH MY 22, POP!
THIS IS MY LUCKY DAY. I FOUND 13 NEW BIRD NEST AN' 11 EGGS
SAY MA, I GOTCHA ENOUGH FLOWERS AN' DOGWOOD T'LAST 6 MONTHS
THESE FISH ARE TOO LITTLE TO EAT, BUT I CAUGHT JUST ABOUT A HUNDRED OF 'EM!
Dix

A Question

by ELEANOR B. STOCK

If we could pick bouquets of stars,
And cut the clouds down too,
The way we pick and tie up flowers,
And cut the pine and yew,

I wonder, would we stay our hands,
Or just denude the sky,
And when the night grew blind and scorched,
Cry out, and ask God why?

Or would we leave some stars unpicked,
A cloud uncut to stand
A tree of white leaves, dropping rain
Upon our greed-burnt hand?

WHAT SOME PEOPLE CALL A GOOD TIME

An Outdoor Good Manners Cartoon by John M. Hix.

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WHAT I THINK OF PELMANISM - By Judge Ben B. Lindsey

PELMANISM is a big, vital, significant contribution to the mental life of America. I have the deep conviction that it is going to strike at the very roots of individual failure, for I see in it a new power, a *great* driving force.

I first heard of Pelmanism while in England on war work. Sooner or later almost every conversation touched on it, for the movement seemed to have the sweep of a religious conviction. Men and women of every class and circumstance were acclaiming it as a new departure in mental training that gave promise of ending that *preventable* inefficiency which acts as a brake on human progress. Even in France I did not escape the word, for thousands of officers and men were *Pelmanizing* in order to fit themselves for return to civil life.

When I learned that Pelmanism had been brought to America, by Americans for Americans, I was among the first to enroll. My reasons were two: first, because I have always felt that every mind needed regular, systematic and scientific exercise, and secondly, because I wanted to find out if Pelmanism was the thing that I could recommend to the hundreds who continually ask my advice in relation to their lives, problems and ambitions.

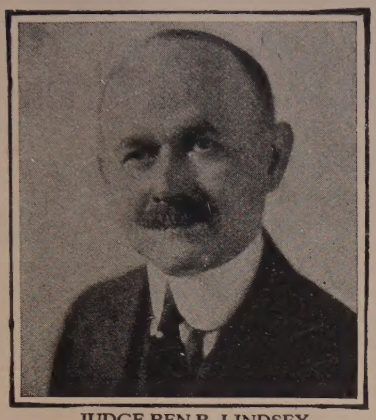
Failure is a sad word in any language, but it is peculiarly tragic here in America, where institutions and resources join to put success within the reach of every individual. In the twenty years that I have sat on the bench of the Juvenile Court of Denver, almost every variety of human failure has passed before me in melancholy procession. By *failure* I do not mean the merely criminal mistakes of the individual but the faults of training that keep a life from full development and complete expression.

It is to these needs and these lacks that Pelmanism comes as an answer. The "twelve little gray books" are a remarkable achievement. Not only do they contain the discoveries that science knows about the mind and its workings, but the treatment is so simple that the truths may be grasped by anyone of average education.

In plain words, what Pelmanism has done is to take psychology out of the college and put it into harness for the day's work. It lifts great, helpful truths out of the back water and plants them in the living stream.

As a matter of fact, Pelmanism ought to be the beginning of education instead of a remedy for its faults. First of all, it teaches the science of self-realization; it makes the student *discover* himself, it acquaints him with his sleeping powers and shows him how to develop them. The method is *exercise,* not of the haphazard sort, but a steady, increasing kind that brings each hidden power to full strength without strain or break.

The human mind is *not* an automatic device. It will *not* "take care of itself." Will power, originality, decision, resourcefulness, imagination, initiative, courage—these things are not gifts, but results. Every one of these qualities can be developed by effort just as muscles can be developed by exercise. I do not mean by this that the individual can add to the brains that God gave him, but he can learn to make use of the brains that he has instead of letting them fall into flabbiness through disuse.



JUDGE BEN B. LINDSEY

Judge Ben B. Lindsey is known throughout the whole civilized world for his work in the Juvenile Court of Denver. He says,

"The human mind is *not* an automatic device. It will *not* 'take care of itself.' Will power, originality, decision, resourcefulness, imagination, initiative, courage — these things are not gifts but results. Every one of these qualities can be developed by effort, just as muscles can be developed by exercise."

Other methods and systems that I have examined, while realizing the value of mental exercise, have made the mistake of limiting their efforts to the development of some single sense. What Pelmanism does is to consider the mind as a whole and treat it as a whole. It goes for mental team play, training the mind as a unity.

Its big value, however, is the instructional note. Each lesson is accompanied by a work sheet that is really a progress sheet. The student goes forward under a teacher in the sense that he is followed through from first to last, helped, guided and encouraged at every turn by conscientious experts.

Pelmanism is no miracle. It calls for application. But I know of nothing that pays larger returns on an investment of one's spare time from day to day.

(Signed) BEN LINDSEY.

Note: As Judge Lindsey has pointed out, Pelmanism is neither an experiment nor a theory. For almost a quarter of a century it has been showing men and women how to lead happy, successful, well-rounded lives. 650,000 Pelmanists in every country on the globe are the guarantee of what Pelman training can do for *you.*

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Touchdown!

Football time again! And the October AMERICAN BOY is chock-a-block with all the corking good football you want!

THE TOUCHDOWN STRUT, *by Rex Lee.* An ungainly freshman who wanted a chance at the varsity boasts, "I can hit a ladybug in the eye with a forward pass at fifty yards." The bystanders laughed at him. But later, when he unlimbered that high-powered throwing arm, when he swung into that swift, pace-shifting run that came to be known as "The Touchdown Strut," folks took him seriously.

Then there's an article by "Navy Bill" Ingram, coach of the famous Navy eleven that established the clearest claim to the 1926 national championship. "Navy Bill" explains just why his team crashed through to victory.

BUILD A MODEL AIRPLANE THAT FLIES. The October AMERICAN BOY begins a series of articles by Merrill Hamburg, a national authority on his subject. He explains how to build a plane that taxies, gathers speed, rises and circles around the room. He tells where to get the materials for its paper-thin propeller, its wings, its fuselage of tropical wood, its rubber motor, piano wire struts and landing gear. Succeeding articles explain the "pusher" model, the indoor endurance, scale and outdoor speed models. Start with the October issue!

UGLY WATERS, *by Thomson Burtis.* "Sunny" Weathers, seaplane pilot, circling above a fishing schooner, detects a furious fight on the deck below. What lay behind it? Mutiny? Murder? Learn what happened when "Sunny" swooped down to help.

THE MAN WHO FOOLED THE NAVY, *by Laurie Y. Erskine.* When Douglas Renfrew soars skyward in his doughty Camel and heads for a flight of German Fokkers, trouble starts popping. Read this and other thrilling stories in October!

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About the Beaver

The beaver is one of the most famous animals of our continent, and deservedly so, for none exceeds him in nicety of adaptation to his environment, and in the possession of an instinct so near the borderline of intelligence, that, as Warren says: "it may as well be called that".

In *The Beaver, Its Work and Its Ways,* by Edward R. Warren (Baltimore, The Williams and Wilkins Company, 1927, $3.00), we have the latest work on the animal. Mr. Warren, well known among naturalists from his studies of mammals, especially those of Colorado, has had many years' association with this large rodent. In this book he has put the results of this experience, and has combined with it the observations of other reliable students, especially where they supplement his own.

Samuel Hearne, who wrote of the beaver (and other animals) in 1795, was the pioneer among the truthful recorders of the habits of this animal. Up to that time, though the native trappers, of course, knew the animal well, the published accounts were so full of untruths, deliberate or ignorant, that they are without interest save as literary curiosities. True, they were hidden away in books so rare that few modern students have seen them. But somehow among the hundreds of writings on beavers that have been set in type in the last century and a quarter, far too many of these erroneous ideas of the olden times have been repeated. And what is worse, as our author points out, even among some modern accounts the time-worn lies are repeated, and some new ones are introduced. The type of story in which the supposed fortunes of an individual or a pair of animals are chronicled for the benefit of the casual reader readily lends itself to this method, and has enjoyed an undeserved vogue.

The book is divided into thirteen chapters, beginning with a description of the animal, and ending with a list of actions reputed to but never attempted by the beaver, and a well-selected bibliography listing most of the more important and most reliable books and papers on the species. Other chapters that especially deserve mention concern its ancestry and its influence on geographical and historical lore; intelligence, engineering and building activities—the dam, lodge, and canals; the meadows it has created,—and they occur by unsuspected thousands; its food; family life; its relation to other kinds of wild life, as fish and birds; and commercial products. More might have been said of its restoration to localities where for a century it has been absent, a feature of its history now rapidly being written, for the beaver, happily, has been rescued from threatened extermination, and is now increasing. May a like fate be the lot of some of its companions of the wilderness.

One of the ideals of the publishers is to issue worthy books, and this is one of them.

E. A. P.

GROUND SQUIRREL AT NATURE'S DINING TABLE

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Wild Life Adventures

by Howard H. Cleaves

Mr. Cleaves is now on the coast of the Canadian Labrador. He will remain in the field more than three months taking photographs and motion pictures of the birds and other life of that region. This is the country visited by John James Audubon nearly one hundred years ago.

Articles for Nature Magazine telling of his Labrador experiences will be prepared by Mr. Cleaves and his new lecture *Cruising the Canadian Labrador* will be ready Nov. 1st. Mr. Cleaves offers also *Outdoors in the West, Birds of the Atlantic Coast* and other illustrated lectures on wild life adventure and travel. For terms and information address: *Extension Department,*

AMERICAN NATURE ASSOCIATION
15 Boudinot Street Princeton, N. J.

Taming the Mosquito

For the past seven years the British Mosquito Control Institute, supported by private subscription and under the directorship of John F. Marshall, has been carrying on significant investigations of the ubiquitous mosquito at its headquarters, Hayling Island, Hampshire. This work has resulted in the evolution of a program of controls and the development of important new data on the pest. A handbook recently brought out by the Institute under the title of *Principles and Practice of Mosquito Control* is in the nature of a report and instructions on control. While the booklet is, of course, devoted to the problem from the British point of view, its contents have no small measure of general application. It is a distinctly valuable report of progress.

Kennel Building

Of interest to the owner of dogs in numbers either for breeding or as landlord to them, is *Kennel Building and Plans*, a small book just brought out by Judy Publishing Company, Chicago. The book gives instructions on locating, laying out, constructing, ventilating and heating and otherwise maintaining an ideal large kennel and winds up with a chapter on the kennel for the single home dog. It sells for one dollar,—the book, not the dog.

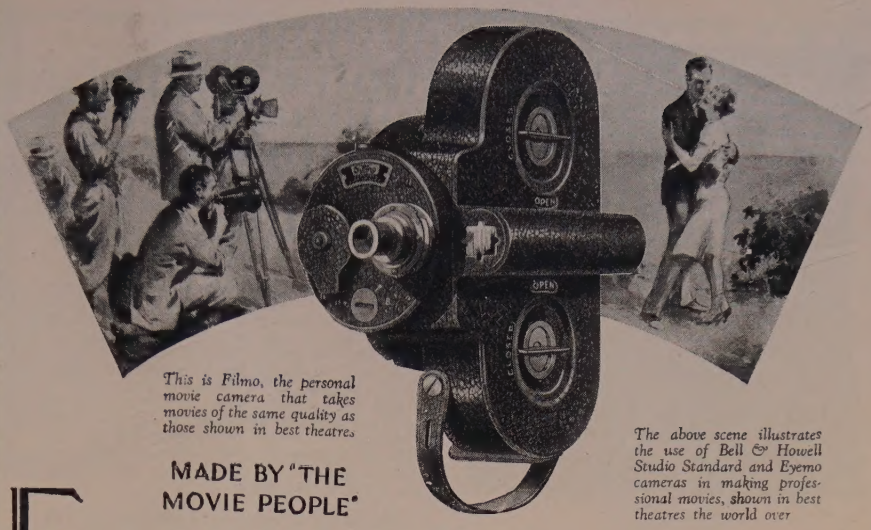
Nature Song Book

A song book for open fields and camps with words and music by Grace Keir, Naturalist for the Brooklyn Girl Scouts, promises to be exceedingly popular not only for its rollicking melodies, but because it has been appropriately illustrated by drawings made under the direction of R. Bruce Horsfall. Published by Carl Fischer, Inc., Cooper Square, New York City; it may be had for $1.50.

Okefinokee Swamp

The great Okefinokee Swamp of southeastern Georgia, probably the most remarkable wilderness of the eastern United States, has long awaited a thorough chronicler, in order to be better known and appreciated by the general public. It has remained for two residents of that region, A. S. McQueen and Hamp Mizell, to provide, in the *History of Okefinokee Swamp*, the most comprehensive account of the swamp that has yet appeared. As the introduction states, "Mr. Mizell furnished most of the data, and Mr. McQueen wrote it up." The former was exceptionally well qualified for the task by his lifelong knowledge of the swamp, where his activities have included those of hunter, farmer, timber-cruiser, lumberman, merchant and practical conservationist. Thus the book—to borrow an expression from Coues— "smells of the woods." It is published by Jacobs and Company, Clinton, S. C., and is listed at $2.50.

The book treats in turn of such topics as natural features, commercial operations, Indians, pioneer settlers, present inhabitants, bird and animal life, hunting trips, and the value of the Okefinokee as a reser-



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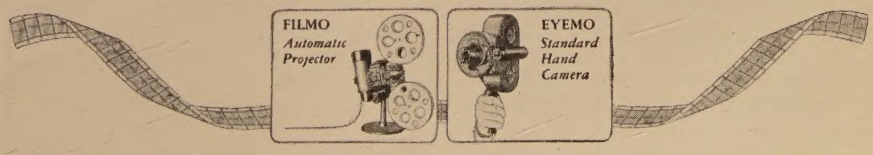

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vation. The observations on wild life are those of a hunter, rather than of a trained zoölogist, and consequently reveal an occasional minor inaccuracy, though unquestionably presented in good faith. The forms discussed are mainly the game mammals and birds, such as deer, bear, cougar, wolf, wildcat, raccoon, otter, ducks, cranes, and herons. The account of the bear forms a rather noteworthy contribution to the life history of the species. There is also an interesting account of the Ivory-billed Woodpecker, which is making one of its last stands in the Okefinokee. The astounding abundance of fish life is illustrated by a record of 41,618 fish caught by hook and line in Suwannee Lake during the season of 1925. This lake, though a mile in length, is only a few rods in width. It is refreshing to find, in an account of the fur industry, an earnest protest against the cruelty of trapping. The book also touches upon the remarkable healthfulness of the Okefinokee; its freedom from malaria has long been known, and has recently been substantiated by an investigation by the U. S. Public Health Service. The numerous half-tone illustrations give an excellent idea of the appearance of the swamp and of the sort of life that goes on there.

Now that lumbering operations in the Okefinokee are practically at an end, after having extended over the past 17 years, the time is ripe for preserving it from drainage or other possible damage. To help bring about the creation here of a great sanctuary for the disappearing wild life of the Southeast, is the avowed hope and aim of the authors in publishing this unusually interesting book. F. H.

Mammals of Utah

Five years ago Claude T. Barnes wrote *Mammals of Utah* and it is sufficient testimony to its value and popularity to say that it has been out of print for three years. At the request of Dr. George Thomas, president of the University of Utah, Mr. Barnes has revised the first edition and it is now brought as a bulletin of the University, Volume 17, Number 12, under the title *Utah Mammals*. It is an excellent booklet of 182 pages primarily designed for Utah but nevertheless of much wider interest.

In the Wilderness

Wilderness Hunting and Wildcraft, by Lieutenant-Colonel Townsend Whelen, published by the Small Arms Technical Publishing Company, Marshalltown, Delaware, is a truly notable book. While we seldom review books that deal so largely with the hunting of animals, and must confess regret that the present volume should have been published by an arms company, the high ideals of the author, and the large amount of reliable habit notes lead us to make an exception. We wish that more authors of books on hunting had the vision to see, and the courage to proclaim, that with our growing population and the narrowing of the wilderness, the day of unrestricted killing is over. Doubtless the pursuit of large game, the meat and skins of which were so essential to the pioneer, did much to make our fathers a hardy, self-reliant race. To a certain extent some of the same qualities can be gained today by the same methods, but there must now be a greater proportion of camping, climbing and matching one's wits against those of the game, and a minimum of killing.

In his introduction the author says: "The primordial instinct to kill for food and trophy, the matching of the human brain against the instincts of a wild animal, and the test of manliness which a wilderness demands, will usually be the call that induces one to take up big game hunting. But I do think that a gentleman will always feel a desire to curb the almost inborn tendency to kill, and that he should limit himself to one or two good heads of each species. If he shoots these in a sportsmanlike manner he will have no regrets, and he will learn the delights of the unspoiled places of the earth, and its fauna and flora. He will appreciate the attractiveness of wild life, the glorious scenery, the sense of solitude, the exhilaration of hard exercise in the purest air, and the test of manhood. Thereafter he will be only too glad to confine himself mainly to photography instead of shooting, and to the study of the habits of the game." And elsewhere: "In these days a sportsman is entitled to just one ram head in a lifetime."

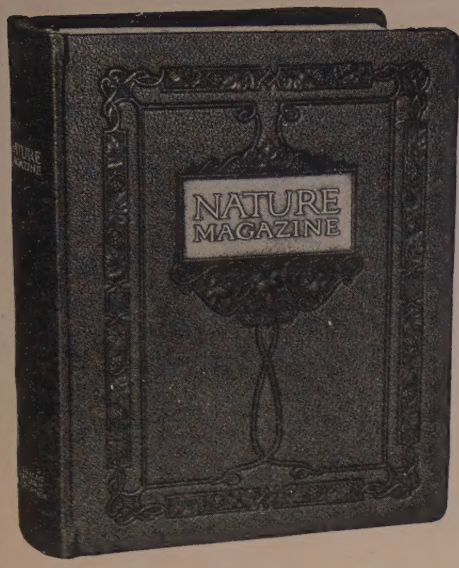
The twenty-odd chapters treat quite fully of the habits of our big game animals; the various species of deer, wapiti or elk, moose, caribou, mountain sheep, mountain goat and the big brown, grizzly and black bears. Much of this material comes from the author's own extensive experience, but he has also drawn freely from other reliable sources. There are chapters on clothing, camp beds, tents, markmanship, photography, and physical preparation, and a bibliography, well selected.

We believe that this book should be in the library of every lover of hunting and wilderness life, and of every student of the life habits of our large mammals.

E. A. P.

Footprints in the Rock

In 1924 Charles W. Gilmore, Curator of Vertebrate Paleontology of the United States National Museum, and a member of the Scientific Consulting Board of Nature Magazine, made a successful trip into the Grand Canyon and brought back with him valuable fossils and tracks of fossils that told fascinating stories of the past. Mr. Gilmore reported his findings in a fine



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bulletin and, also, through the pages of this magazine. In 1926 Mr. Gilmore was enabled to make a second trip, which proved to be as rich in returns as was the first, and he now presents his results in a second report of the Smithsonian Institution brought out as Publication 2917. To anyone with the exploring instinct the report is fascinating for its adventure, and, of course, from the scientific point of view it is of outstanding significance. Mr. Gilmore has recreated a number of new prehistoric animals and his contributions to the branch of science which he graces have been signal in character.

Lone Girl Scouts

A key to the Girl Scouting game for Lone Girl Scouts is an admirable guide to new Girl Scout Leaders, as well, because it sets forth the steps along the Tenderfoot Trail in such a lucid and attractive manner that one is inspired to follow it to the end and then wish for more. We are assured that more is to follow in due time when further steps along the way are to be presented in much the same manner as in *The Lone Girl Scout Trailmaker*. It is sold by Girl Scouts, Inc., 670 Lexington Avenue, New York City, for 35c.

Our Wild Animals

In his preface to *Our Wild Animals* Edwin Lincoln Moseley says: "This book has been written to supply accurate information about most of the wild mammals common to North America. Primarily, the volume is intended as an interesting science reader, but it has a deeper purpose in that it presents scientifically accurate facts about most of our wild animals in a form that children in the intermediate grades can read, understand and enjoy". We could not review this volume any better than to say that its author appears eminently to have achieved his purpose. It is published by D. Appleton and Company, New York.

Controlling the Rat

Education and experiment is gradually winning the fight against the rat, and indications are that the numbers of the troublesome rodent are decreasing. To aid in the further winning of the fight, the U. S. Department of Agriculture has brought out a new bulletin entitled *Rat Control*. It is written by James Silver and is known as Farmer's Bulletin No. 1533. Copies can be obtained for five cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Answer to the September Nature Puzzle

ALLIGATOR

Caruso's

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October, 1927

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NATURE CALENDAR

OCTOBER

by E. Laurence Palmer

ON an October day a number of years ago Christopher Columbus discovered or rediscovered America. Ever since then those who followed him have been discovering new and interesting things about the nature of the continent. Some of these things, in fact very, very many have been of more value to civilization than the discovery made by Columbus and the nice part about it is that there are still to be discovered unquestionably many of Nature's most valuable secrets. Columbus' voyage to America was not his first ocean trip. Few if any of the great explorers into Nature's secrets have made their big find with their first attempt but you can be the first one to see and feel many things in Nature and these experiences may lead to worthwhile discoveries later on.

There is scarcely a place on the continent outside the cities where you cannot dig a foot deep into the earth and see land that no human being has ever seen before. The nature of this earth may be characteristic enough to tell you whether it was once a part of a glacier, whether it was a lake bottom, a stream bottom or whether it has long been covered with vegetation. In this earth you may find in October other explorers such as insects, earthworms, moles and the like. Like human explorers these creatures may have made their pilgrimages into unknown territory for the sake of food and shelter or to escape the attacks of the elements or of living enemies. Others may have wandered aimlessly into the unknown regions.

Whenever a tree is cut down for firewood real virgin timber is exposed to your view. No one has ever seen the wood of a newly-cut stump before the tree was felled.

Plant physiologists are not agreed as to the movement of food and water in various plant parts. They are still cruising around in unknown seas.

Many creatures kill trees. Take an afternoon off and attempt to learn what caused the death of most of the trees to be found in your woodlot, park or orchard.

William Penn arrived in this country in October and found a great area abundant with game and forests. Later a part of it was named Pennsylvania or Penn's Woods. Today we are trying to renew our supply of sources of wood supply. In most cases we are planting cone-bearing trees. These do not supply the abundance of food for game to be found with hardwoods.

October strips the leaves from hardwoods of many kinds leaving all kinds of game exposed to hunters. Inform yourselves on the game refuge idea and the game refuge bill.

At Lake Merritt in Oakland, California, ducks that avoid all sorts of humans elsewhere will approach great crowds without fear of death. A conference of secretaries of Chambers of Commerce at Lake Merritt would help the game and the game sanctuary idea by showing these influential citizens the publicity value of such a reserve. Why is there no such thing in connection with our large eastern cities? There are an increasing number of taxpayers who prefer to see their game alive and they have their rights as well as the others.

Snow may be the order of the day for October over a considerable portion of the United States. The higher bits of land will certainly begin to show snow patches. Have you discovered for yourselves that these highlands differ from the lowlands not only in respect to the presence of snow but also in respect to the kinds of trees, herbs, birds, mammals and insects to be found? The life on Mt. LeConte in the new Smoky Mountain Park is very different from that in Gatlinburg a few miles away and so it is with almost any other bit of mountainous country. These differences may be very marked in October.

In connection with our park system and the game problem it is appropriate to mention that Roosevelt was born in October. Though all did not agree with him, his teachings and example did much to call the attention of the public to things out of doors. His writings may still lead Nature lovers along pleasant paths, though the vigor of his personality cannot now be called upon to assist where it would now be most welcome.

For October, then, read Roosevelt and, with Columbus, discover new secrets of Nature in your own backyard wherever that may be.

AMERICAN BISON, OR BUFFALO

NATURE MAGAZINE

Volume Ten

No. Four

October, 1927

THE KING OF THE PRAIRIES

HIS BALEFUL EYE A'GLEAM

THE BISON of HOUSE ROCK VALLEY

by Will C. Barnes

On the north side of the Grand Cañon of Arizona, that mighty gash on the face of the globe that cuts Arizona so completely in two as to make the region north of the Cañon almost a terra incognita, there is a large semi-desert valley adjacent to the Kaibab Plateau known locally as House Rock Valley from a huge rock which, at a distance, bears a striking resemblance to a house.

Uninhabited except for a few isolated sheep and cattle camps; almost waterless as far as running streams are concerned; without a mile of road worthy of the name and the nearest railroad point more than 165 miles to the northwest, only the most venturesome tourists have until recently penetrated its solitudes. A few years ago two men found their way on horseback into this valley in search of adventure. Riding across the open range one day they noticed a cloud of dust in the distance which seemed to be moving very rapidly towards them. Suspecting the cause of the dust to be a bunch of wild horses that roam those distant ranges in large numbers the riders pulled up their horses on a little knoll and waited for the animals to pass them.

Near and nearer came the great tawny cloud of dust, but so dense and all-enveloping they were unable to see the animals that made it.

Then came a breeze that blew the cloud of dust away and the animals were in full view.

Imagine the astonishment of the two strangers when, instead of horses, they found themselves looking at thirty or forty great, heavy-maned hump-backed animals which they quickly realized were buffalo, the true American bison. Wonderful specimens of the old time plains buffalo, the "crooked backed oxen" of the early Spanish explorers in the southwest.

The great surprise was a bald-faced one in the bunch showing signs of a Hereford cross in his blood, a most unheard of situation indeed to the observers. At sight of the men and their horses the buffalo stopped

HIS BISONSHIP
One old bull escaped and terrorized the country

for a moment, then moved ponderously on down the trail to the water hole. As they passed out of sight around a small knoll the men turned and looked at each other with inquiring eyes; "Buffalo—real, live plains buffalo —here in the midst of an Arizona desert" gasped one. "It's absurd, whoever heard of buffalo on this side of the Rockies"?

Later on they saw more of these animals, many branded on the left hip with a regular cattle brand; their ears marked as stockmen mark cattle and sheep. Inquiry developed the fact that these buffalo were the property of several local stockmen.

Stockmen were quite frank in denouncing the animals as a pest on the range, for they were continually tearing down wire fences or breaking through stockade corrals built around watering places, dangerous to horsemen if crowded too closely and altogether "undesirable citizens" in every sense of the word. Naturally the men were curious as to the origin of this herd of buffalo; how they came here in this out of the way spot; how did they cross the mighty cañon that fenced them off from the south and east. Local information on certain points was not very definite nor well supported by satisfactory evidence. After considerable research the following facts have been secured and are here given for the first time that a fairly complete record may be made as to the origin of this Arizona herd of buffalo; exotics in a land far from their ordinary habitat. As far as possible every bit of information secured has been checked carefully.

The originator of this herd was Charles J. Jones, nationally known as "Buffalo Jones" who, realizing the buffalo were fast disappearing, captured in the years from 1884 a number of buffalo calves out of a herd then running in the vast open prairie region along the North Fork of the Palo Duro river in the Texas Pan Handle.

Jones took his captives to his ranch near Garden City, Kansas, and, beginning with fifty-seven captives, eventually raised a very good sized herd of buffalo, ranging them with his domestic cattle.

Some time between 1895 and 1900 financial troubles overtook Jones and he sold his Garden City herd; part of it was purchased by a man named Allard who shipped them to Montana. This herd was later sold to a man named Kennedy who also lived in Montana.

The rest Jones sold to a Spaniard from California who shipped them to a ranch in that state near Monterey.

Jones then made a trip to the Arctic regions in an attempt to bring out of that country a bunch of musk oxen. Returning via the Yellowstone region he fell in with an old time friend and pioneer, James Owens, who for several years had been a guide and park scout in the Yellowstone National Park. Between them the two old timers conceived the idea of starting a great game preserve somewhere in the West and stocking it with big game animals, deer, elk, and buffalo, with the intention of selling hunting privileges at good stiff figures. Jones had previously explored that vast uninhabited region in northern Arizona on the north side of the Grand Cañon, where on the "north rim" lay a huge uplift called the Kaibab Plateau, shaped somewhat like a great flatiron with the sharp point to the north. Cut off from the rest of the world on the south by the Grand Cañon and surrounded on the other sides by a fifty-mile belt of rough desert country this table land bulked several thousand feet above everything else, its steep sides covered with piñon and juniper trees while on its fairly level top was a glorious yellow pine forest. To the east of it lay "House Rock Valley" a vast open prairie country, treeless but covered with excellent range grasses. The early Mormon pioneers called this Kaibab Plateau the "Buckskin Mountain," due to the large herd of deer found there and from which the Navajo and other Indians annually secured large numbers of buckskins from their hunting.

It seemed an ideal location for their scheme and a sort of partnership was formed between Jones, Owens, and a well-known Mormon pioneer living in the region by the name of E. D. Woolley.

The area included in the Kaibab Plateau had been set aside by the Federal Government in 1893 as a Forest Reserve in order to pre-

THE CHALLENGE
The King of the herd sounds the call to battle

serve the timber from fire and spoliation. So Jones went to Washington in 1906 to lay his plan before the Federal authorities in charge of the Government forest properties.

The result of his visit was a written agreement between Jones and the Federal authorities under which, on January 8, 1906, he was granted permission to enclose a large area of land on the Kaibab Plateau on which to place the buffalo and other wild animals he and his partner proposed to bring into the region.

It was Jones' tales of the great deer herds on the Kaibab Plateau and his enthusiasm for the region as a game country, that interested President Roosevelt in the idea of making a large federal game preserve there and led to his order establishing in 1906 the Grand Cañon National Game preserve, which covered the entire plateau and part of the country adjacent to it.

For many years Jones had been obsessed with the idea of perfecting a cross between the wild buffalo and our native range cattle. He believed sincerely that such a cross would carry the beef values of the cow and the extreme hardiness of the buffalo. Thus the hybrids would be able to withstand the hardships of the western range winters and thrive on short feed and scarcity of water. This cross was called "Cattalo", and, if my memory serves me right, the word was coined by Jones. Several other western range men had experimented on this cross, but Jones undoubtedly did the real pioneer work in getting the cross into the public eye. Jones also had another cross-breeding idea in his head which involved the crossing of the fat-tailed Persian sheep with the western Merino. Through this cross he believed he could produce a very heavy-bodied, unusually hardy animal suitable for the hardships of the western ranges. These he named "Persiarino", another of his coined words. As a matter of fact the Cattalo proved a rank failure, and the Persiarino, although very hardy and prolific, produced extremely coarse wool and were more often black than white.

In July of 1905 Jones unloaded at Lund, Utah, a small station on the then recently completed Salt Lake-Los Angeles railroad, two cars of buffalo. The exact number is a matter of dispute but there were between thirty and forty head in the shipment. Those buffalo were shipped from Monterey, California, and oddly enough were a part of the identical buffalo shipped to that point from Garden City, Kansas, several years before.

It has been impossible to learn the causes that led up to the return of these buffalo to Jones. The Spaniard who took them to Monterey intended to do some experimenting in crossing them with native cattle. Jones was notably careless in his business deals, and the supposition is that they were taken back in satisfaction of an unpaid note.

This shipment was met at Lund by Forest Ranger T. C. Hoyt, who was sent by the Government to help drive the animals across the country some two hundred miles to their future home on the Kaibab Plateau. Hoyt hired two men to help him, and as the weather was warm and the country a desert the buffalo were very hard to handle. Hoyt solved the difficulty by loading a wagon with sheaf oats bought at a Mormon settlement and when the herd stalled, a few handfuls of the green oats coaxed the animals to move along. In this way with infinite work and patience and several loads of oats the bunch reached the Kaibab country without losing an animal. The shipment had been crossed with Holstein cattle while in California and several of the hybrids were black and white with white faces instead of the dull rusty brown of the pure-blood buffalo.

Early in 1906 a shipment from Montana of eighty-seven head reached Lund. These were the remnant of the herd from Garden City previously sold by Jones to Charles Allard in Montana, some of which undoubtedly originally came from Kansas as heretofore stated. Here again the causes that led to Jones securing posssession of these Montana animals are not clear. There is no living person known who is acquainted with the facts and Jones left no written record of the deal. It can only be surmised that they were not paid for by Allard or his successor Kennedy, and Jones was obliged to take them back.

Forest Ranger Hoyt was again sent over

THE GRAZING HERD
In the background is one of the interesting formations of House Rock Valley

to meet this second shipment which drove very easily excepting one animal a big and very old bull that refused absolutely to go further. The men in charge of the shipment were forced to leave him, but word reached them that the lone animal was creating havoc at Hurricane, so while the men kept the bunch on the trail Hoyt went back to see what could be done with the straggler. Arrived at Hurricane, Hoyt found the King of the Prairies parked in the middle of the community alfalfa field taking life easy but making things decidedly interesting for any one who undertook to dislodge him. Hoyt was an expert cowboy and finally managed to rope the buffalo, and, with the help of every man and boy in the settlement, dragged him by the saddle horn to a corral in the middle of the village where he tied him to a cedar tree with the heaviest rope that was to be found. Hoyt then agreed to pay for the care of the buffalo until word could be received from Jones as to his future.

The rope was long enough to allow the bull to reach an irrigation ditch that ran through the corral and twice a day several terribly scared Mormon kids forked alfalfa hay over the corral fence where the animal could reach it, and then ran for their lives. Eventually the old chap, cross and sore from the rough handling he had received, made a vicious lunge at several adventurous kids, who had entered the corral to inspect this latest addition to the fauna of Utah and Arizona, and broke the rope that held him. They broke the record getting out of the way of those keen black horns.

Then "Bison americanus" sought revenge for the indignities placed upon him by running amuck through the village. He tore down fences; ravished green fields and gardens; gored two or three horses; chased all the town milk cows out on the desert; and for several days kept the residents of the little hamlet in an uproar. Then seeking new fields to conquer he started on the back trail for Lund, which town he finally reached leaving behind him a trail of ruin and desolation in the way of stampeded freight teams he met or passed along the way. Every horse that came in sight or smell of him at once proceeded to throw not one but several fits, stampeding off into the desert adjoining the road regardless of reins or the load behind them. One freighter with a ten mule team dragging sleepily up a long grade met his Bisonship at a sharp turn of the road. The leaders took one look at the monster, wheeled, and swung back dragging with them the other teams until the whole outfit was tied up in one struggling mass around the huge freight wagon.

The driver sitting side ways on the near wheel mule jumped to the ground and met the oncoming bull with a shower of rocks, barely making the top of the high hind wheel of his wagon ahead of those keen horns.

Eventually Hoyt arrived on the scene at Lund; shot the bull; sold all the meat he could; and took the hide and head to his ranger cabin as a trophy of what was probably the very first buffalo hunt ever held in Arizona.

In 1907 Jones purchased eight young bulls from the buffalo herd of Mr. Austin Corbin in New Hampshire. These were placed in the herd on the Kaibab together with a number of Galloway cows with the idea of crossing the buffalo with those coal black cattle and securing a hide with better color and hair. The cross proved unsatisfactory, however, and the experiment was a failure.

The transplanted buffalo, true to their primal instincts, refused to remain in the fenced enclosure in the mountains where they were first placed and proceeded to make their way down into the open prairie country in House Rock Valley, where they made themselves very much at home.

In the fall of 1909 Jones, finding his venture unprofitable and tiring of the whole experiment of crossing buffalo with native cattle, gathered together all the buffalo he could round up, drove the bunch to Lund and shipped them to New Mexico. These he eventually sold to a cattleman near Fort Sumner who still has them or their descendants in an enclosed pasture near there where on their ancient grazing grounds they appear to be well content.

The fifteen or twenty buffalo left in the House Rock Valley by Jones were purchased by two or three local cattlemen and have increased until recently they numbered more than one hundred head. They are such a nuisance on the range, however, that frequent efforts

FIVE MEMBERS OF THE HERD

The State of Arizona has now bought the bison of House Rock Valley and will give them the run of the open range

have been made to drive them out of the country with herds of steers enroute to shipping points on the railroad.

Invariably the buffalo, after a few hours on the trail towards civilization have decided they like House Rock Valley very well and in spite of everything the cowboys could do to keep them with the steers, every single buffalo turned back to its favorite range.

In the fall of 1924 the Grand Cañon Cattle Company while removing the remnant of their large herd of cattle from House Rock Valley determined to make a last attempt to move some of their share of the buffalo. Accordingly the cowboys roped about a dozen young calves out of the herd as they mixed with the cattle, placed each in a crate, loaded them all on trucks and hauled them to the railroad from whence they were shipped to the company's large fenced ranch in Old Mexico. There they will form the nucleus of a future herd of buffalo in that country.

The remaining members of the buffalo herd have now been purchased at a price of $10,000 by the State of Arizona, the money being raised by hunting fees. The Game Warden states that the bison will be given the run of the open range as a part of the State's game. Each year every buyer of a hunting license will get a numbered slip. Twenty numbers drawn by lot will entitle the holder to shoot one male buffalo each, or twenty killed each season. The warden hopes to stimulate the sale of licenses in this way. At the same time the herd will be kept at two hundred head as agreed upon by state and federal authorities.

And so this is the story of the Bison of House Rock Valley that came to the western slope of the Rockies from the west and not, as one might expect, from the east.

THE GRAND LAKE STREAM KINGBIRD

by Louis B. Chace

USUALLY the Kingbird prefers the family apple or pear tree for its home, but here the birds nested miles back in the great Maine woods. The tree selected was an old dry cedar, bearded with gray wavy lichen, partly uprooted by some unscrupulous windstorm, and bowed solemnly over a beautiful lily-studded winding stream known to the locality as Junior River.

LYNWOOD M. CHACE

THE KINGBIRD BRINGS HOME A MEAL

Caught by the camera at the minute of feeding its downy youngsters

After climbing the tree and locating the camera so that the lens focussed upon the bird-home, the operator led a string about two-hundred feet in length from the camera release to a concealment. There the photographer waited nearly an hour for the return of the parent Kingbird with provender for its downy young. Here are the results of a pull of the string as the Kingbird perched.

Planting Your BULBS

LILIAN A. GUERNSEY

THE DECORATIVE NARCISSUS

This is one of the most interesting bulbs and one of the most attractive in the home

EARLY in the Spring, even before the snowdrifts have all disappeared in shady corners, the snowdrop and crocus come up from the brown earth to gladden those who are weary of the Winter. Then, later on, as the days become warmer, the tulips, hyacinths and narcissi are unrivalled in the early Spring flower garden. Within the brown bulbs that we plant this Fall are tiny buds around which food is stored so that with the first warm Spring days their bright blossoms will burst forth.

Besides flowers in the garden, we can have a wealth of blossoms in the house from November to Easter. Unlike most house plants, bulbs do not require careful attention for many months before blooming but are content to spend most of their growing period in a dark cellar. Then, when placed in the light, they flower in a short time.

LUXURIANT EASTER LILIES

Forced plants growing in a government greenhouse

The first and most important step toward success with bulbs is to get large, sound bulbs. The bulbs must grow for several years before they reach blooming size, but this period is spent in a nursery so that they should be ready to bloom the next Spring when we buy them. Most of our common bulbs have been grown in Holland, where bulb culture has long been an established industry, but we are now forging ahead in this work in the United States.

A point that many who are inexperienced in bulb culture misunderstand is that, with the exception of lilies and a few summer flowering bulbs, all must be planted in the Autumn. In most parts of the United States bulbs do best when planted in October, but in the South the time will be somewhat later, according to the climate. At this time of year the soil is still warm, but the air temperature drops to the freezing point at night. Under these conditions the bulb will make a strong root growth so that, when Spring arrives, the development of leaves and buds will be rapid. The time of potting for indoor flowering is governed only by the keeping qualities of the bulbs.

Bulbs look well in solid beds, in borders, or in clumps among shrubs

Helpful Hints to the Flower Lover on a Fascinating Hobby

by

Walter B. McFarland

U. S. DEPT. OF AGRICULTURE

THE LILY OF EASTERTIDE

Here is a plant grown from seed and which produced twelve flowers after fifteen months

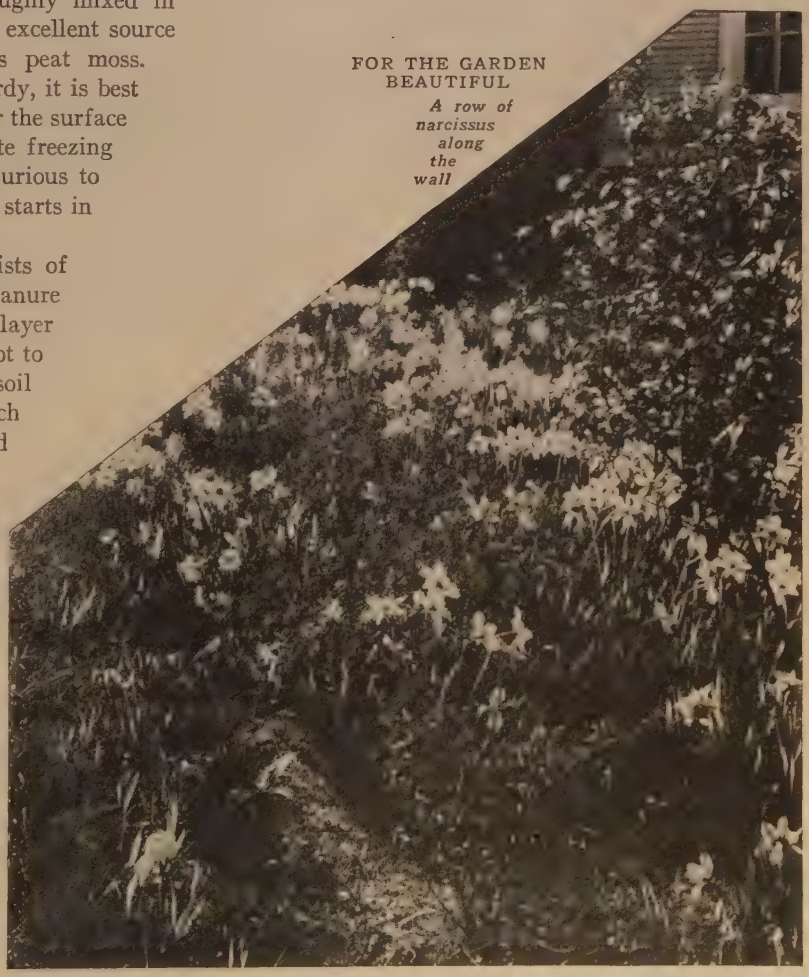
or hardy perennials. Very effective geometrical designs may be worked out in many colors of tulips or hyacinths. Care must be used, however, to select varieties having the same height and blooming season. When planting a circular bed fewer bulbs will be needed if the outer rows are set closer than those nearer the center. A tulip bed may be kept in bloom over a long period by alternating rows of early and late varieties. Never allow them to go to seed after blooming, as it removes the strength from the bulb that otherwise would have gone toward making next year's flowers.

Many bulbs flower the first year in almost any soil, but for continued results the soil must be improved. They do best in a rich sandy loam. Before planting the soil should be stirred at least a foot deep. A liberal quantity of sand and fertilizer thoroughly mixed in will put it in a condition to plant. An excellent source of humus is commercially known as peat moss.

Although most bulbs are entirely hardy, it is best to mulch them with straw or leaves after the surface becomes frozen. This prevents alternate freezing and thawing, a condition which is injurious to them. Remove the mulch before growth starts in the Spring.

A good soil for potting bulbs consists of one part humus, one part well rotted manure and two parts sandy soil. First place a layer of coarse gravel in the bottom of the pot to insure drainage. Then fill in sufficient soil so that the bulb will be about an inch below the rim of the pot. The pots should now be watered and placed in storage.

The commonest method of storage is to set them in a dark cellar where the temperature is low but does not drop to the freezing point. The hot dry atmosphere near a furnace is very unfavorable for their development. If proper conditions are not available in a cellar, they may be stored in the garden. Set the pots *on* the ground and cover to the depth of about four inches with sand or sifted coal ashes, there to remain until bulbs are well rooted which can be determined by examinations of the pots. If pots are sunk in the ground, bulbs are likely to be kept too wet for development of good roots.



FOR THE GARDEN BEAUTIFUL

A row of narcissus along the wall

If stored in October, pots may be removed by late January. When first brought to the light, place them in a cool north window for a week after which give them sunshine. Examine pots stored in a cellar occasionally to see that they do not become too dry. Successful flowers depend on the strength of the roots formed during this period of their growth.

All bulbs do best in a rather cool place, as too much heat is liable to force them too rapidly, resulting in weak stems. Tulips and narcissi need strong sunlight, but hyacinths will do well with a moderate amount. As soon as the flower is well opened it should be moved to a cool place out of the sun, as it will last much longer if treated this way. Hyacinths may be moved out of the sun as soon as the color begins to show in the buds.

EDOUARD ANDRE TULIPS

So wide is the range of color combinations in tulips that they always delight

Earliest of all Spring flowers are the snowdrops, scillas, and crocuses. These are very beautiful when scattered at random in the lawn or in ribbon lines of solid color. The snowdrop is white and the scilla blue, but the crocus comes in several colors. They should be set about two inches deep and flower best if undisturbed for several years.

For many years the tulips have been one of our best-known spring-flowering bulbs. They will always be popular because of their gorgeous colors and stately appearance. Several types are usually offered for sale. The single early tulip is the first to bloom, but in some regions they are likely to be caught in late April snowstorms. It is the best variety for forcing. Early in May the Darwin, Cottage Garden and other late tulips come into bloom. They grow considerably taller than the early ones and have larger flowers. They are being more extensively planted every year as they become better known.

Tulips should be dug and replanted every other year. If solid beds are wanted, it is best to use new bulbs each year, as some of the old ones always fail to bloom. However, the old ones will bloom after a year's rest and may be placed in a border where evenness of bloom is not required. Annuals such as poppies, verbenas or asters may be planted in the bed before the tulips die down. These will make it bright until Fall when the bulbs may be removed.

Tulip bulbs are hardy and frost will not injure them until they sprout, and not then unless the ground is heaved by frost which frequently separates flower-bud from stem. The early varieties are best for forcing, but the Darwins do well if given plenty of time and a cool place in which to flower. They merit care and study.

HYACINTHS

Beautiful flowers of the fragrant L'Innocence

Another of the bulbs that is universally known is the hyacinth. They come in several shades of pink, blue, yellow and white. The bulbs are quite expensive, but it pays to buy the best. Bulbs not less than seven inches in circumference should be chosen if they are to be used for forcing. Smaller ones will be equally satisfactory for outdoor bedding, however.

They are most effective in solid beds. Give them plenty of moisture after active growth begins. The bulbs keep well and may be planted as late as the ground can be worked. Those planted late will bloom later than those planted early. Set them four to eight inches apart and four to five inches deep. Bulbs that have been flowered in the house will probably bloom next year if the bulbs are properly ripened.

CALIFORNIA DAFFODILS
This flower is known as the sea-gull from the arrangement of its colors

The hyacinth may also be grown in water. For this special glasses should be used. The base of the bulb should just touch the water until roots form; afterwards it is best to leave a space of a quarter of an inch between the water and the bulb to prevent decay. Keep them in the dark until large roots have formed and the tops are an inch high.

The narcissus family includes many old-fashioned favorites. Most of them are hardy and not particular in their requirements. When once established, the bulbs will continue to multiply and bloom almost indefinitely. They are particularly useful for naturalizing in a sunny meadow or in a large lawn. Each variety should be put in a separate clump, as they do not look their best when mixed. Set the bulbs four or five inches deep. Should they not flower well after a few years, reset them after the leaves are dead, enriching the soil and giving them more room.

Of the several varieties, the large trumpet narcissus, commonly called daffodil, is the most showy. The double ones are also very beautiful and are perhaps the best for forcing. Their golden and silver blossoms will fill a room with sunshine at a time when the sun often hides his face behind the clouds. The

TULIPS
Rich blossoms of the Allard Pierson

medium trumpet, poet's narcissus, and poetaz types are graceful and artistic. Jonquils are small and do not make the show that the other trumpet narcissus do, but are liked by some people. Bulbs which can only be grown outdoors in the southern states, but widely grown indoors, are the Polyanthus narcissus and the Chinese Sacred Lily, which is not a lily but *Narcissus tazetta orientalis*. The Chinese narcissus is usually grown in water. There are several kinds of the polyanthus narcissus but all may be easily grown. The paper white narcissus is grown in water like the Chinese narcissus or may be grown in soil. If planted in November the Chinese narcissus and polyanthus narcissus will provide flowers for Christmas.

When growing them in water place the bulbs closely in a dish and pack small pebbles around them to support them. Fill the dish nearly full of water and set it in a cool place until the bulbs are well rooted.

The ixia and freesia both come from the Cape of Good Hope. Neither is hardy in the northern states so must be grown indoors. The bulbs of both are small and a six-inch pot is large enough for a dozen. The growth of the leaves starts at the same time with the roots so they cannot be left in the dark more than a few days. Give them plenty of water and do not let the temperature exceed seventy degrees.

Since Biblical times the lily has been considered a symbol of beauty. They require more care and attention than the common bulbs and are more expensive. However, some of them will last for many years when established, as clumps of tiger lilies may be found in old gardens where they have stood undisturbed for generations.

The lily family contains many beautiful plants that are much sought by the flower lover. In most parts of the United States wild varieties may be found growing. Any of these are easily transplanted if bulbs are moved in the Autumn after the leaves are dead, or very early in the Spring. Lilies may be grown from seed and some varieties like *Lilium regale* and Easter lily have flowered in nine months, from seed. The tiger lily may be reproduced by means of the small bulbs that grow in the axils of the leaves, and is a decidedly hardy growth.

THIS ARTICLE by Mr. McFarland inaugurates a series of practical and helpful articles for the garden lover who finds much Nature interest in his or her growing flowers. These articles will be written by authorities and will make up a valuable group. The article for November will be "Gardens Under Glass", by Estelle H. Ries.

Most lilies should be planted in the Fall. Some kinds will do equally well if planted in the Spring but Fall planting is preferable if possible. The bulbs do not mature early and are not to be found on the market until late October. The Madonna lily, *Lilium candidum*, differs in that it should be planted in September.

The soil must be made as deep as possible for the bulbs are set deeply and do best if not disturbed as long as they bloom well. Set large varieties such as *Lilium auratum* five inches deep. Place the bulb on an inch of pure sand and then fill in around it with sand. On top of this put the prepared soil. As a general rule set the bulbs at a depth of twice the greatest diameter of the bulb, but *Lilium candidum* should be set only an inch and a half deep.

The Bermuda Easter lily, *Lilium longifolium eximium* is forced in quantities by florists. Everyone is familiar with these waxy white flowers. They may be grown by anyone who has had a little experience in horticulture.

Select large bulbs, for, although the small ones will bloom, they are not very satisfactory. A single bulb may be placed in a seven-inch pot or a twelve-inch pot has room enough for three. After providing drainage put in enough soil so that the top of the bulb will be three inches from the rim of the pot, place bulb in soil and fill pot to within half inch of top. Roots will form on the stem above the bulb making the plant stronger. However all lilies must be staked to keep them straight.

Store them like any other bulb. When they begin to grow set the pot in a cool window where it will receive sun each day. Let them remain here for at least two months. At the end of this time they should be strong healthy plants, ready to bloom. Now move them to a sunny position where the temperature is several degrees higher. Give them plenty of water and once a week apply some liquid fertilizer. They should bloom in a few weeks' time.

There are numbers of other bulbs that may be grown indoors or in the garden. Most of them will succeed under the same general conditions as those already named. If you are a flower lover, by all means try planting a few bulbs in the Fall as you are certain to be rewarded with success and highly pleased with the flowers that you will have this winter and next Spring.

The Sociable Redwing

by William Leon Dawson

Photographs by the Author

THE tricolored redwing is a rank socialist. No doubt of that. And the irritating thing about them—for Mrs. Tricolor is a member of the party also—is that they are very happy and successful socialists. The male carries a scarlet ensign, the red flag, on either shoulder; but he is also a white-ribboner, and the white patches which border the red epaulets are always much more in evidence than the dangerous red, especially when the bird is at rest. It may be correctly inferred that our socialistic blackbird is really a very mild-mannered and disciplined citizen, and that we may safely accept conduct through one of his model cities.

Every model tricolor city is built in the reeds, preferably in the narrow-leafed cattails; and, other things being equal, the larger the reed patch the larger the colony. A very model city, a real commune, must have waterways, two or three or, maybe, four feet deep, and a reedy cover so dense that one who has the good fortune to dwell there, or even to visit it for an hour, may forget the world and its tribulations. In default of gondolas, we shall have to wade. And I promise you that when once the reedy mazes shall have closed over your head, you will cease to remember that you are a human,—hampered, conventionalized, prosaic; and you will believe that you are a wading-bird, investigating the palaces of Utopia.

Feel the soft ooze squshing between your toes, every step a separate adventure, and every considerable advance claiming an additional dry inch or so of your reluctant surface! Oh, it would be horrible if it were not so fascinating. We are in a forest of perfect greenery. Every separate cattail leaf is an architectural marvel, a vaulting miracle of infinitesimal, juicy, vegetable bricks placed end to end, spearing at the sky bravely, yet resigning the effort midway in a changing curve of ineffable grace. The horizon lies ten feet away; the outside is past; the world is gone. Remains only the sky, and that is fretted and lashed by a thousand interlacing arches of cattail leaves.

AT HOME IN SWAMP CITY
The tricolored redwing, Agelaius tricolor, *lives among the spears of the cattails*

Remains only the sky,—and these fascinating brown baskets. Our decorous tricolor hosts have withdrawn quietly. They are not specially anxious, and, besides, they had rather intended to snatch a bite to eat in the neighboring meadow about now. The baskets, which are the houses of this curious city, are partly woven, partly plastered; and the instrument which has served alike for shuttle and trowel is the beak of Lady Blackbird. Each nest is lashed firmly within a group of upright cattail stems; and an art which anchors an edifice midway of such unencouraging rods is a high art. The sides of the nest are both woven and coiled, but the bottom is coiled only, and that most ingeniously. I have seen a dead cattail leaf five feet long reduced to a single close-set spiral. The body, or matrix, of the nest is made of macerated leaves, or vegetable waste, laid on wet. Occasionally a little mud finds its way into the composition, but this is not essential. And, finally, after the matrix is well dried, a smart lining of coiled grasses is added, and egg-laying begins.

We shall have time to examine a few eggs before the owners come back to claim them. There are, normally, four of them to each nest,—pale niagara green as to

(Left) RETURNING TO THE CITY
Their community is a veritable commune in some measure after the Russian idea

(Below) ABOVE SWAMP CITY
This bird is gregarious at all times, nesting in numbers

ground color, curiously splotched or scrawled with an intense brownish-black pigment. At a time the markings assume the regularity of a wreath about the larger end. At another they form hieroglyphics or Arabian script; or else go meandering off along fancy's wildest path. And of all commonplace mysteries, I think the quaint scrawling of a redwing's egg is one of the most intriguing. It might be the record of a telegraphic code in Martian. Or it might be the scribbling of baby spiders just returned from an excursion over the mud cup of a deliquescent toad-stool. Anyhow, it is as piquant as wild honey, and as diverse as the moon pattern on shimmering waves.

But if we have forgotten quite that we are trespassers, a returning volley of blackbirds will remind us. A mild anxiety has seized them, and they suddenly repeople the reeds with dusky, shifting forms, and they speculate upon our business in husky whispers or subdued croaks. The tricolored redwings become to us a strange people when they sing, or try to converse. Instead of the hearty *konqueree,* or the lively *keyring* of the swamp redwing, *Agelaeus phoeniceus,* we have, *Look awaay choke, awaay awaay choke,* or *awaak* or *chuaack choke,* as though sound were being squeezed out of a nearly empty bellows. An anxious *jup* note reminds us rather of the crow blackbird than of cousin *phoeniceus;* while, if we were to retire to the oak-clad foothills, where belated courtships are still in progress, we should hear the curious "stomach-ache song" of the yellow-headed blackbird only stopped down and subdued, as everything, perforce, must be if these socialists are to get on with their innumerable fellows at all.

As we push through the swamp, volleys and storms of blackbirds arise. We had not dreamed there were so many. It is because the nesting is in its early stages yet, and the clamor of young has not been added to the solicitous calls of hurrying parents. Three or four weeks more will tell another story. Caution and the need of restraint have been forgotten. Enormous numbers have encouraged every blackbird heart; and, although their voices are mild at all times, the combined uproar of a tricolor city of, say, twenty thousand inhabitants, in full domestic blast, may be heard a mile away.

This sociable redwing is gregarious at all times. Even when seeking food for the young, the birds proceed by little bevies and platoons, rather than singly. Of necessity they deploy upon the field of action, for a whole flock may not concentrate upon a single bug; but as soon as the gullet is full, the bird attaches itself to one of the returning platoons, and these, as likely as not, have formed into a regiment by the time Swamp City is regained. As contrasted with the individualistic behavior of the common redwing at nesting time, this flocking tendency is in itself distinctive. Moreover, the flock motion of the tricolor is altogether different from that of *phoeniceus* at other seasons. Instead of the straggling, happy-go-lucky fashion of *phoeniceus,* noisy, protesting,

THE LADY OF THE FAMILY (Right)
Her home in the cattails is nothing short of an architectural marvel in nest building

A DISTURBED MEAL (Below)
The redwings go out in a body to forage for their food

or wayward, we have strictest silence and regimental discipline of movement. The tricolors pass quietly, with not so much as a rustle of wings, and they move close to the ground, or at most at an elevation of fifteen or twenty feet. Each member of the flock rises and falls with each recurrent effort of the wings, quite independently of his fellows, but he moves in an established rhythm, with no vacillation, or tendency to break away. Each bird is solely, and ominously, intent upon "getting there."

But it is, perhaps, in the zoning system enforced in Swamp City that the discipline of tricolor's activities is most clearly shown. Nesting commences on schedule and proceeds with the regularity of clockwork. We do not know where the High Council convenes which assigns quarters to the incoming citizens, but we do know that first comers, to the number, it may be, of a thousand, gather in the center of the swamp. Days pass and nothing is done. Then as at a given signal, all fall to work and begin nest-building. This central group, of those who have received building licenses, works thenceforth unremittingly, and with such uniformity of success that a visitor can determine the very day when first eggs, second eggs, and so on, laid by practically every female member of the commune. Newcomers—and there is from now on a constant stream of influx—in like manner, group themselves in a section immediately adjoining the central colony. These first tarry for recruits, and then set to at a given signal. Thus, in contiguous but distant sections of a large swamp, one may find the nests-under-construction group, the one-egg-laid group, the just-hatching group, and so on, all on the same day. In some smaller swamps, there are concentric rings of activity, and it is here, evidently, a case of "first come first served," with no thought of waiting upon anybody else's opinion.

However admirable the home life of these sociable redwings may be—and we have not time to follow it up now—we are obliged to confess that their economic relations leave something to be desired. I know it has been quite the fashion of late to put little tin wings upon all birds, irrespective of color or previous conditions of sassitude; but when we have outgrown this childish stage, we shall have to admit that some birds—a few—are bad actors. The screech owl, *Otus asio,* for example, has come in recently for authoritative condemnation; and I for one am glad of it. For I know that certain little heaps of brown feathers found in my live oak trees once belonged to hermit thrushes, and I know that *Otus asio* is responsible. In like manner, the sociable redwing makes pretty heavy demands upon the grain fields of his native country. I wish it were not so. Swamp City is very, *very* much more interesting to me than an oat-field. Perhaps now that our iron horses have learned to eschew oats, we shall not need to raise oats any more. But if you must raise oats, or barley, or rye, or rice, please go a long, long way off from Swamp City, where the Soviet is always saying, discouragingly, *Look awaay, or choke.*

A BLACK MASK WORN JAUNTILY

A rogue in many ways, Lotor also has the insignia of the highwayman across his cunning eyes

BRUIN'S *Little* BROTHER

by Howard Taylor Middleton

Photographs by the Author

THE OCTOBER midnight is crisp with just a hint of frost. A billion stars wink out before the advancing splendor of the old leaf-falling moon. Somewhere along the hardwood ridge beyond the pine-clad hill blares out the sweetest sound in all the outdoor world to those of us who are on this fanciful chase to-night—the ever-thrilling music of coon-hounds baying "Treed!" With oldest and warmest coats upon our backs, and on our eager feet the stoutest softest boots, we have long been awaiting that strident chorus—listening for canine bugles to sound the charge to battle.

Near my southern New Jersey home, dogs do not "speak" while tracking coons—are not loquacious to the point of filling the forest aisles with clamor when first keen nose is set to trail, as I'm told they do elsewhere. The sort of hunt we stage o' moonlit nights has a less spectacular beginning, I grant you, but even though our uncommunicative mongrels keep their opinions strictly between their glistening teeth until the quarry is safely up a tree and ready for the plucking, when they *do* "open up", O man, what melody they make!

Nature tomes testify that coons do not travel far, but it seems a long wild scramble through cat-briers that pierce and tear, o'er fallen logs that are safely hurdled or send us sprawling, even as Fate is kind or cruel, until we arrive at the foot of the tallest tree on all that countryside, and the hardest one to climb. There at the very top a lump of gray fur shows dimly in the eerie moonglow, huddled close against the swaying trunk. A breath-taking upward mounting, a shake, a growl, a leap, and the quarry lands among the dogs with five fierce weapons ready for the fray: bared dagger-fangs and four feet, needle-clawed.

Reigns pandemonium now as the combat wildly rages. Dog after dog tries his skill at closing in with the clever little fighter, who lies upon his thick-furred back and rakes each antagonist from stem to stern with slashes from fiery cutting nails. A scurrying and a snarling and a swearing in the leaves, then "Y-o-o-o-w!" yelps Nero

JUST CALL ME "EZRA"
A raccoon pet of a farmer lad of the New Jersey pine barrens

IN THE EERIE MOONLIGHT
A lump of gray fur shows dimly, huddled against the swaying trunk

shrilly, in deepest sympathy with a badly lacerated ear, and "O-o-o-o-u!" bellows Caesar, from the depths of his blood-striped stomach, while a gray ball rolls swiftly out of the melee and bounces away toward an adjacent tree trunk and safety.

Of course, it does not always end like this. When the coon is less of a champion, and hounds spring from sterner stock, a kill is made. Then again it is not a coon at all peering down at us from the tip-top of the tallest tree, but a night-blooming Thomas cat that has gold-bricked the crestfallen dogs.

All this excitement in golden harvest time, the prolific season of nuts and fruits and roasting ears, when *Procyon lotor,* as the scientific-minded label my hero, is in full panoply of fat and fur and finesse. In order that he may live up to his nickname—the Indians called him "Little Brother of the Bear;" you know—he, too, like Bruin must soon head for slumberland, must find a cozy bedchamber high up in some hollow tree, there to snooze the cold hours away in comfort while icy blasts sweep down the wooded trails until sweet Springtime arrives again in forest green.

Along in February, if a thaw should come, Lotor will probably stick his sharp nose outside the bedcovers of dead leaves and sniff the pungent breeze. If the scent denotes winter gone, he will emerge hesitatingly as a sleepy farmer boy on Sunday morning, and look round a bit. Should the ground be bare, a leisurely descent will follow, and then an amble off to the nearest stream for a long-delayed breakfast. However, when a sombre gray blanket of melting snow still wraps the world in dirty ermine, Lotor yawns a bit, again impersonating that afore-mentioned sleepy boy, and goes back to bed for another nap. He is not too hungry yet, you see, and if there is one thing Lotor hates to do, it is to put his feet in slush. Eventually, though, keen appetite must triumph over ease, and next we find him at his fishing, and, more fascinating still, his washing. Let us then, playing the part of eavesdroppers on a still later moonlight night, hide behind a protecting screen of withered foliage the winter wind has kindly spared for us, that we may watch the doings of this furry fisher lad. Look! he has found a mollusk, and taking it skilfully between fore-paws, dexterous as your hands or mine, he bites with strong sharp teeth, crunching the hinge asunder. Then thrusting the bivalve backward between his long hind feet, it is held securely there as in a vice. Next, without bothering to look or smell, he brings his nimble fingers into play once more. Promptly finding the weakest spot, he forces the shells apart, and ladles out the juicy meat, fragment by delicious fragment. Now though breakfast is apparently quite ready, it is not eaten for a while. Again and again each succulent morsel is soused in the cedar-stained water of the brooks barren's until it reaches that superlative degree of cleanliness that Lotor's fastidious tastes demand, after which the meal is daintily consumed.

LOTOR AT HIS WASHING
He is very fastidious about the cleanliness of his meals

Yes, indeed. Bruin's Little Brother is extremely fond of shellfish, particularly Lotor of the meadows, known in the New Jersey barrens as the "marshland coon", but eggs and young birds during nesting time, and corn, when in the milk, are also *pieces-de-resistance* upon Lotor's bill-of-fare.

For those unfortunate folk who have never met Bruin's Little Brother upon some secluded woodland path, we will take time to describe his size and color scheme a bit e're vacating our ambush behind the oaken screen; and say a word or two anent his home life as well. Lotor occupies about as much space in this world of ours as a fox, but he is not nearly so

canine in contour. Also he is more plump in build and not nearly so graceful in movement. A coon ambles in rather clumsy style, a la plantigrade, when on the ground while Reynard seems verily to flow along, so chock full of grace and litheness is his every movement. Although I believe Reynard to be by far the bigger rogue of these two foresters, it is Lotor who carries the insignia of the highwayman, to wit: a black mask worn jauntily across his cunning eyes.

The tints of the clothes my hero wears are rather difficult to describe. At first sight one is apt to pronounce the color gray and let it go, but it is really more than that because there is black in evidence also, and the tones shift their preponderance according to the position of the observer and the arrangement of the fur. The ulster overcoat is made up of long and somewhat stiff hairs of alternately black and grayish-white, and then there is a close-fitting suit of underwear beneath of soft and woolly texture which is uniformly gray.

"COONING IT"
An expression coined from Lotor's voyages along friendly logs

The average number of baby coons is about three, although there are often four or more, and they make their appearance in the fragrant month of May within the leaf-lined tree cavity high up in the roof of the forest which constitutes the raccoon nursery.

The New Jersey barrens dwellers have an expression, "cooning it," describing a timid person's method of crossing a stream on a fallen log. Another phrase is "coony", meaning to have great cunning and sagacity, and both are highly appropriate in Lotor's case. While he is almost as quick and nimble a voyageur along aerial highways as a squirrel when necessity calls, he takes no chances with Fate as does Silver Plume, when he's scared. A squirrel will often leap out wildly into space and widely miss the limb he's volplaning for in sheer stark fright, but not so Lotor. He never loses his footing nor his head, no matter how hard pressed by dog or man.

A young raccoon is as delightful a pet as country boy ever had, and the most affectionate. A lad I know was once the proud possessor of one of these forest children named "Ezra", and perhaps the funniest sight I ever witnessed in all Natureland came to me while watching the boy ploughing in a field with Ezra following after. Many a tender grub came to light behind the plodding ploughshare, and Ezra's chief aim in life, upon this late Summer morning, was to try to salvage them all. This, of course, took time, and soon Ezra found himself far behind—so far indeed that to all appearances he was a lost baby in a plough-torn world. Standing erect, like the Big Brother of the Mouse, Br'er Groundhog, when on look-out duty, he gazed in all directions, but his eyes, though sharp, told him nothing. Then he started sniffing. Ah, that was more like it for at once he caught the mingled odors of boy and mule, and with a whimper of rapturous relief, he hurled his chubby body along in the trough of the furrow, toward his master—and sanctuary, until at last the plough was stopped and Lotor cuddled tight against his master's breast to get his vanished courage back.

"Never you mind, Ezry," crooned the boy, "don't be skeered. I wouldn't let you git losted; no, siree!"

Then the sunshine of a great relief shone down again upon the wood-rimmed field, "Ride with me fer a spell, Ezry, 'till we git to the end of the row. Haw, Jinny!"

So that was the never to be forgotten picture I took away with me that Summer day: a small boy skilfully guiding a mule-motored plough, and a shaggy coon balancing precariously, but *so* happily, atop a blue-flannel shoulder, that of his friend and comrade.

SNIFFS THE PUNGENT BREEZE
Lotor investigates the state of the season from his lofty home

REYNARD IS A GREAT ROGUE
In many ways he is a much bigger scamp than Bruin's Little Brother

IT LOOKS LIKE A POLITICAL ARGUMENT
Harry engaged in angry dispute with another jay, and a great argument it is, too

JUST JAYS

by Ernst and Ottillie Keil

(Photographs by the Authors)

THERE IS, perhaps, no other bird so fittingly described by its name as the blue jay. Blue is the dominating color of his jaunty livery, and his favorite call is a hilarious "jaying". If his reputation were as spotless as his beautiful coat, he might be more esteemed, but his harsh voice, his often overbearing manner and, worse, his cannibalistic habit of now and then robbing the nests of other birds have made him thoroughly disliked in respectable bird society. Twice last summer I was just in time to see a jay snatch a halfgrown cardinal out of its nest and carry him away amid the frantic screams of the distracted parent birds. But with it all, the true Nature and bird lover finds in the handsome, dashing fellow many traits that are admirable.

During Fall and Winter, when the main activity is to make the most of life, even the mistrusted jays pass seemingly unnoticed. Old animosities have been lulled to sleep by the hustle, shared by all, to make a living. But when Spring draws closer the attitude of the feathered tribe towards the jays undergoes a very decided change. Robins, cardinals and all the others suddenly seem to remember the evil reputation these blue-coated dandies have and will attack them at the slightest provocation. How spitefully the woodthrush snaps her beak when unexpectedly confronted by a blue jay on our bird bath! Even the wrens, energetic mites, will charge him savagely when he comes closer to their living quarters than they consider good form. I do not believe that blue jays often rifle a woodpecker's nest, yet I have often watched a pair of redheads chase the jays out of the dead tree in which their nest was concealed. It is plain that every bird knows the shortcomings of the jay and is on guard against him. Such is the plight of one with a dark spot on his reputation!

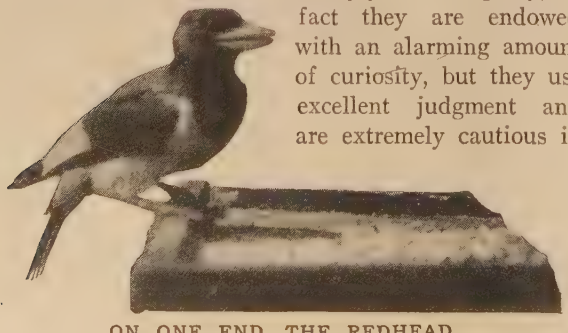
In April, if the weather is favorable, the breeding season begins and during that time Mr. and Mrs. Blue Jay may be seen at their best. What a gallant swain he is, and how fiercely he will fight for her possession if an over-zealous rival attempts the slightest flirtation. How anxious he is to protect and please his lady fair. The choicest morsels of food he brings to her and she gracefully accepts his courtesies as mistress of the contemplated household. Their nest is a well-constructed affair placed in the crotch of a tree from six to forty feet from the ground. The female lays from four to six

A DARING BABY
It ventured from its home and had to be foster-mothered by "Nick"

beautiful olive-green eggs, thickly speckled with brown.

At The Wren House, our homely cottage, the first consignment of small blue jays makes its début usually the later part of May under the careful tutelage of the proud parents. How those little blue puffballs in their fluffy white bloomers tumble and squawk about the old place. They are happy and boisterous because they are on the wing, but their judgment of distance and their control of wings is poor. When they launch into the air they rarely reach the place aimed for. But what they lack in skill they make up for in noisy enthusiasm and persistence. After a few days they are able to follow the old ones to the mess-table, where they are given a taste of everything on the bill-of-fare for that day. Before many days have passed the youngsters feel quite at home in their new surroundings and as their self-reliance increases a luxuriant crop of the well-known bluejay symptoms begins to sprout.

Nobody could accuse the blue jays of being shy, in fact they are endowed with an alarming amount of curiosity, but they use excellent judgment and are extremely cautious in all their ventures. But once they are convinced that they have nothing to fear and are unmolested in their chosen locality they become very friendly and are quick in recognizing friendly people. Jays really have their standards of conduct—such as they are—and with a little patience and a liberal allowance for their irrepressible nature they make first class neighbors. Like mischievous boys they like to play pranks. They are clever in imitating the calls of other birds, and take a devilish delight in stirring up a commotion among their winged brethren by suddenly sounding the dreaded "killy, killy, killy," of the sparrow hawk.



ON ONE END, THE REDHEAD
The woodpeckers regard the jay with suspicion and distrust

Our feeding station for wild birds is open all the year around and a dozen or more blue jays are among our daily guests. Although we offer a great variety of food, the jays prefer peanuts to anything else and to get them they are ready to unlimber a whole bag full of their choicest tricks. Some of them will even venture to our porch to get them while we sit there. But a few years ago we had one in particular who seemed to be driven by an uncontrollable passion for that delectable food. He would throw all precautions to the winds and come within a few inches of the chair occupied by "Nick", the Mistress of The Wren House, snatch up the coveted morsel and dash to the nearest tree with it. That jay was in a class all by himself. He was an unusually big and handsome fellow with the dash and deviltry of a dozen ordinary blue jays all rolled into one. He successfully matched wits with anything on wings and there was not much that escaped his keen black eyes. He was the only one of the whole lot who could muster courage enough to come through the open door into our living room, while we sat around, for a peanut placed on the floor for him in the center of the room. He was so different from any bird we had ever seen on our feeding station that we felt he was entitled to an "honest-to-goodness" name and somehow, Harry seemed to fit best.

Early in the morning Harry, with the boldest of the tribe, would come to investigate the porch, roaming through the flower boxes, over the chairs and the swing. I often heard their busy feet and their softly gurgling conversation. When Nick went outside to fill the lunch counter and called her boarders, our jays were always the first to shout their approval. Harry invariably led the chorus and once in a while he would grow so skittish over the approaching feast that he dropped a trifle prematurely out of the lower branches of the old oak tree, landing on Nick's shoulder or head. Surprised at his own audacity he would turn tail at once and dash back to the tree, fairly exploding with joy over his daring.

For some reason Harry had taken a wholehearted dislike to a pair of redheaded woodpeckers who had a

nest near by and were steady customers at our mess-table. The dislike was, of course, mutual and they often exchanged violent courtesies right on the banquet table. Although Harry had a wholesome respect for the redheads' ability to take care of their affairs, he managed to annoy them a great deal and showed his contempt for them whenever he felt safe in doing so.

Harry was by far the most likable jay who ever graced our mess-table. There was another jay who made his appearance one day late in Fall. He discovered our bird hotel and decided to spend the Winter with us. In a way I am glad he did, for in a very short time he taught us how radically different two individuals of the same family may be. We never saw the newcomer in company with any other bird, so we called him The Bachelor.

AFTER THE BATH
Usually sartorially correct and a dandy but not so just now

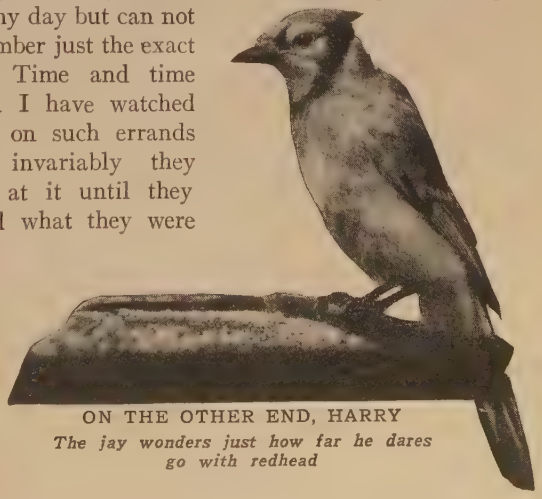
He was not larger than the average jay but very dark in color, so dark in fact that the blue in his plumage was hardly noticeable. All his movements were nervous and fitful. His entire conduct reminded one of a criminal haunted by a guilty conscience and in constant fear of the hand of justice. Even his face seemed pinched and drawn. In a short time he had the family spirit of our feeding station completely demoralized and I was tempted more than once to shoot him. Even his brother jays shunned him, and when his domineering ways became unbearable they would band together and "rawhide" him so that feathers flew in all directions. But fighting was The Bachelor's very nature and he always returned no matter how thoroughly he had been thrashed. All the smaller birds who frequented our foodshelves lived in terror of this freakish bully.

Spring came at last. We were in hopes The Bachelor would find a mate who might, perchance, influence him for the better, although we disliked to contemplate the possibility that he and is offspring might elect to remain in our locality. However, Spring meant nothing to this wayward creature and the balmy breezes of April aroused no responsive chord in his heart, which seemed completely out of tune with Nature. Poor, hapless bird!

One day in May we were watching a proud little chipping sparrow who had her young assembled on the ground under our foodboard and was busy filling their hungry stomachs. Suddenly The Bachelor dropped out of no-where and pounced upon one of the youngsters, attempting murder before our very eyes. Of course we thwarted his sinister intentions, but that was the last strain. I was ready for him had he returned. We never saw him again.

A good deal has been said and written about the food-hoarding habit of birds, and the question whether or not they make intelligent use of the concealed provisions has been widely discussed. Our jays are very accommodating fellows and have furnished us some first-hand information. Like some other wild creatures, the jays revert during the Fall and Winter in particular to the hoarding of food. The daily menu for our feathered friends consists of suet, leavings from the table, mixed grain, peanut-butter and peanuts. The shelled peanuts with the rest of our offerings find their way with uncanny rapidity into the spacious crops of our blue jay guests, but the nuts still in the "jacket" are industriously carried off to be hidden away at random. They are not at all particular in selecting a hiding place for their provisions, most any place will do. Among the leaves under the grape arbor, a depression in the ground, or at the base of a tree, are favorite spots.

Now, as long as the mess-table is well supplied those stored provisions are—apparently—forgotten. But let the foodboard be empty! For a while our jays will skip around, talking and complaining freely about our neglectful ways. Then suddenly something seems to "bob-up" in their minds. Straight away they fly to the ground and instantly snow and leaves begin to fly. The search is never conducted in a systematic manner, but rather in an aimless sort of way. Digging here and there and yonder until, perchance, they unearth a peanut they had hidden away some time before. It seems they know, in a general way, where they have laid up something for a rainy day but can not remember just the exact spot. Time and time again I have watched them on such errands and invariably they kept at it until they found what they were after.



ON THE OTHER END, HARRY
The jay wonders just how far he dares go with redhead

A STALK OF THE AGAVE
It puts most of its vitality into growing this stem, atop which the flower finally blooms

The PLANT that BLOOMS TO DIE

by Mabel A. Stanford

Photographs by Wright M. Pierce

IN THE southwestern part of the United States and in Mexico there grows a member of the lily family which blossoms, in many species, only after ten or twenty year's growth. After the supreme act of flowering this one time, it dies. This is the agave, commonly called the American aloe or century plant. All of the strength of the plant goes into the single flowering stem so that the growth of many years culminates in one set of blossoms. Thus its common name refers to the time of growth before blooming.

The agave has more than three hundred species which vary in size from small plants grown in garden pots to those whose flowering stems are twelve feet high. It is considered an ornamental plant in the United States where its species are used to ornament terraces and walks as well as collections of fancy plant growers. In Mexico it is as useful to the natives as it has been since very ancient times.

The species which are found in the southern part of California and Lower California grow for the most part under desert conditions. The plants themselves are of a rosette of stiff, spiked leaves with or without a trunk. In many instances the rosette is close to the ground. From this circle of leaves, when the plant has gathered sufficient strength for blooming, rises the flowering stem which resembles a giant asparagus stalk. This conical bud rises often at the rate of a foot a day before it blossoms with the yellow flowers at the top. The fact that the act of putting forth the huge flower stems takes all the vitality from the plants shows the unfavorable conditions under which most of them live on the deserts, table land, or rocky hillsides. However, an interesting point is, that while the plant dies after it blooms, it has remarkable vitality when uprooted. When these plants are removed as land is cleared they grow in the piles where they are heaped.

Propagation of such a plant could not depend entirely upon seeds, although the flowers bear them. Small bulblets form in the flowers also, and some plant buds drop off and take root. The plant spreads by means of sucker roots which branch from the main part and send their sprouts from the surrounding sand. Thus some of the

A HILLSIDE OF *AGAVE SHAWII*
They frequently grow in colonies where sucker roots have spread out from the original roots

plants grow in closely packed groups which thickly cover an area of many feet.

There are four kinds which grow in Southern California and Lower California. The species *Agave utahensis* grows in Death Valley, where its flowering stalk reaches a height of five to eight feet. *Agave consociata* is in the country from the San Jacinto hills to Lower California. It has no trunk and the rosettes of leaves form dense circular colonies. The *Agave deserti* is also similar to the latter.

The fourth is the *Agave shawii,* which, although almost extinct there, grows in the southern part of San Diego county near the coast at the boundary line and thence into Lower California where it abounds. This kind likewise grows in colonies where the sucker roots have spread and the new plants come up to form a mat of rosettes. Its flowering stem rises eight or ten feet from the garnet-margined leaves which are from eight to twenty inches in length. These are stiff and edged with hook prickles. Its flowers are also yellowish orange in color.

The agaves have various uses. The roots of one species have a soap quality; another yields the well-known Sisal hemp. The most famous use, however, is in the making of the Mexican drinks, pulque and mescal. Some species, just before flowering, yield a gallon or two of saccharine juice each day for some time. From this pulque is made. Authorities say that mescal, which is a distilled drink, is usually made from the juice of a different species.

These southern agaves are found in the same territory in which many of the yuccas grow. One has been useful to the natives of Mexico while the other has been useful in the lives of the Indians since the days of the cliff dwellers. Useful or ornamental, these agaves are another interesting adaptation of plant life to meet living conditions in a region where moisture, so essential to all life, is at a premium.

Perhaps more than usual significance attaches to the two pages of color in the November issue. The subjects will be twelve ducks and accompanied by an article by a member of our Scientific Consulting Board, Dr. Harry C. Oberholser of the United States Biological Survey, who is in charge of the nation-wide duck census. The color plates are particularly beautiful and will be useful in connection with the census.

The Great Horned Owl

From an Original Etching
by Benson B. Moore

American Bald Eagle

From an Original Etching
by Benson B. Moore

THE GREAT AMERICAN SEA SERPENT
A complete version of its anatomy. It was even given a Latin name, Scolophis atlanticus

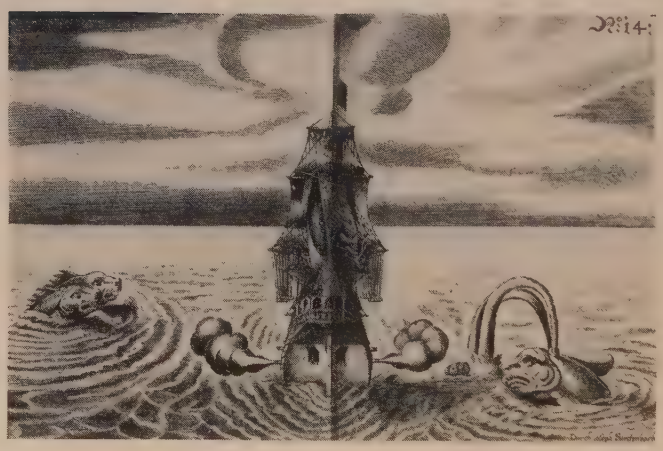
THE GREAT SEA SERPENT

by Elliot Snow

Rear Admiral, Construction Corps, U. S. Navy

"Strange things come up to look at us
The masters of the deep".
—Song—"The Return of the Admiral".

JOSEPHUM FURTTENBACH, in the year 1629, wrote a book about ships which had sailed many waters long before he was born, —just as many of us are writing these modern days. For some reason or other, Furttenbach made no attempt to tell anything about East Indian *kutch kotias,* Chinese *jongs,* Arabian *baggalas,* Egyptian funeral *barges* or *dragons* of the Norsemen. The dragons were so called from the bow and stem ornaments representing the head and tail of some, presumably fabulous, animal of the sea. It was in a dragon of 1247 that King Haakon set out from Bergen to meet Cardinal William of Sabine, to embrace Christianity. It is not entirely safe to assume, however, that the animal or serpent of the sea which served as a model,—call it *motif* if you prefer, —for the design of the bow and stern of a dragon was indeed only fabulous. Nor would it be wise to affirm in the same breath that there are no such living things as sea serpents; or that none has ever been seen and *authentically* reported.



FIGHTING THE SEA SERPENT
Artillery was carried to ward off attacks from these monsters

Josephum Furttenbach evidently believed in sea monsters of bizarre and forbidding aspect, differing, but unessentially, from the creature depicted in Egede's work of 1740. The early use of ships artillery to fight off an attack by sea monsters of this sort is, too, an interesting record, which antedates the record given to us by the *Daphne* by some two hundred and twenty-five years.

THOSE who read Admiral Snow's interesting article on the "Goose Tree" will be equally interested in the result of his delving into literature about the famed and fabled sea serpent.

In the very early medieval days, ships were as a rule smaller in size than many "denizens of the deep" and so it is not to be wondered at that mariners all but fainted and their eyes saw "big" when a leviathan of the deep came charging at them. We know of these attacks, from the writings of Marco Polo, who tells us that the Chinese invented watertight compartments to keep their ships from being sunk from the thrust of the great sword fish. These fish mistook the Oriental *jongs* as competitors for food in the seas of China, and fought accordingly.

My belief in the former existence of sea serpents, and in "The Great Sea Serpent" in particular, rests on a much firmer basis than the fanciful pictures of Furttenbach and Egede, or the carvings of Olaf Trygvason. Scarcely a month goes by that one does not hear heralded the finding of the remains of some antideluvian animal which flew in the air like the pterodactyl; wandered through the fastnesses of the earth like the mastodon; or wallowed in swamps or swam the lakes and rivers much as do, today, hippopotamuses and crocodiles, or as sea serpents must have done in the recent past.

If John Gerarde, after what he believed to be very careful observation in 1636, could write so circumstantially about "The Goose Tree," why cannot one today write with even greater authority

UNDER THE STERN OF THE *DAEDALUS*
According to the Captain and several of his officers this is what took place

about the Great Sea Serpent particularly when one has at hand the official reports made October 11, 1848 by Captain Peter M'Quhae, R.N., of Her Majesty's ship *Daedalus*.

This (at that time) new and official attestation of the "Great Sea Serpent", was brought about by an article printed in the *London Times* of October 7, and which said:

"When the *Daedalus* frigate, Captain M'Quhae, which arrived here on the 4th inst., was on her passage home from the East Indies, between the Cape of Good Hope and St. Helena, her captain, and most of her officers and crew, at four o'clock one afternoon, saw a Sea-Serpent. The creature was twenty minutes in sight of the frigate, and passed under her quarter. Its head appeared to be about four feet out of water, and there was about sixty feet of its body in a straight line on the surface. It is calculated that there must have been under water a length of thirty or forty feet more, by which it propelled itself at the rate of fifteen miles an hour. The diameter of the exposed part of the body was about sixteen inches; and when it extended its jaws, which were full of large jagged teeth, they seemed sufficiently capacious to admit of a tall man standing upright between them."

The appearance of this article evidently came to the attention of the British Admiralty, because four days later, Captain M'Quhae was called upon for an official statement of the occurrence. Whereupon, he submitted a report to Admiral Sir W. H. Gage, G.C.H., at Devonport, saying:

"In reply to your letter of this day's date, requiring information as to the truth of a statement published in the *Times* newspaper, of a Sea-Serpent of extraordinary dimensions having been seen from Her Majesty's ship *Daedalus*, under my command, on her passage from the East Indies, I have the honour to acquaint you, for the information of my Lords Commissioners of the Admiralty, that at five o'clock P. M., on the 6th of August last, in the latitude 24° 44′ S., and longitude 9° 22′ E., the weather dark and cloudy, wind fresh from the N. W. with a long ocean swell from the S. W., the ship on the port tack heading N. E., by N., something very unusual was seen by Mr. Sartoris, midshipman, rapidly approaching the ship from before the beam. The circumstance was immediately reported by him to the officer on the watch, Lieutenant Edgar Drummond, with whom and Mr. William Barrett, the Master, I was at the time walking the quarter-deck. The ship's company were at supper.

"On our attention being called to the object, it was discovered to be an enormous Serpent, with head and shoulders kept about four feet constantly above the surface of the sea; and as nearly as we could approximate by comparing it with the length of what our maintopsail-yard show in the water, there was at the very least sixty feet of the animal *a fleur d'eau*, no portion of which was, to our

ONE VERSION OF THE BEAST
This is the way Egede visioned the sea serpent in 1740

THE *DAEDALUS* SIGHTS THE SEA SERPENT
Mr. Sartoris, a midshipman, sighted it and called the Captain and fellow officers. No wonder!

perception, used in propelling it through the water, either by vertical or horizontal undulation. It passed rapidly, but so close under our lee quarter that had it been a man of my acquaintance I should have easily recognized his features with the naked eye; and it did not, either in approaching the ship or after it had passed our wake, deviate in the slightest degree from its course to the S. W., which it held on at the pace of from 12 to 15 miles per hour, apparently on some determined purpose.

"The diameter of the Serpent was about 15 or 16 inches behind the head which was, without any doubt, that of a snake; and it was never, during the 20 minutes that it continued in sight of our glasses, once below the surface of the water—its colour a dark brown, with yellowish-white about the throat. It had no fins, but something like the mane of a horse, or rather a bunch of seaweed, washed about its back. It was seen by the quartermaster, the boatswain's mate, and the man at the wheel, in addition to myself and officers above mentioned."

Not very long afterward, the editor of the London *Globe* received and printed a letter from the master of the *Mary Ann* of Glasgow telling of the *Daphne's* experience, which he recorded thus:

"I have just reached this port, on a voyage from Malta to Lisbon; and my attention having been called to a report relative to an animal seen by the master and crew of Her Majesty's ship *Daedalus,* I take the liberty of communicating the following circumstance:—

"When clearing out of the port of Lisbon, upon the 30th of September last, we spoke the American brig *Daphne* of Boston, Mark Trelawny, master; she signalled for us to heave to, which we did, and standing close round her counter, lay to while the mate boarded us with the jolly-boat, and handed a packet of letters, to be dispatched per first steamer for Boston on our arrival in England. The mate told me that when in lat. 4° 11′ S., Lon. 10° 15′ E., wind dead north, upon the 20th of September, a most extraordinary animal had been seen—from his description, it had the appearance of a huge serpent or snake, with a dragon's head.

"Immediately upon its being seen, one of the deck guns was brought to bear upon it, which having been charged with spike-nails and whatever other pieces of iron could be got at that moment, was discharged at the animal, then only distant about forty yards from the ship. It immediately reared its head in the air, and plunged violently with its body, showing evidently that the charge had taken effect. The *Daphne* was a leeward at that time, but was put about on the starboard tack, and stood towards the brute, which was foaming and lashing the water at a fearful rate. Upon the brig nearing, however, it

AN INTIMATE VIEW
The head of the beast according to the good Captain M'Quhae

disappeared, and, though evidently wounded, made rapidly off at the rate of fifteen or sixteen knots an hour, as was judged from its appearing several times upon the surface. The *Daphne* pursued for some time; but the night coming on, the master was obliged to put about and continue his voyage.

"From the description given by the mate, the brute must have been nearly 100 feet long, and his account of it agrees in every respect with that lately forwarded to the Admiralty by the master of the *Daedalus*. The packet of letters to Boston I have no doubt contains the full particulars, which I suppose will be made public."

Following this, one of the ablest British naval surveyors—an officer of high scientific attainment—Captain Beechey R.N., wrote a letter to the Admiralty hydrographer, from which the following is extracted:

"What an extraordinary creature the *Daedalus* seems to have fallen in with? The description recalls to my mind an extraordinary appearance we witnessed in the *Blossom*, in crossing the South Atlantic. I took it for the trunk of a large tree, and before I could get my glass upon deck it had disappeared and I could nowhere find it—fresh breezes at the time".

Finally some testimony came from a gentleman, long resident of Norway, who wrote:

"Several years ago, a museum was established at Bergen in Norway, the directors of which have, amongst other subjects of interest, turned their study to natural history in general, and to the elucidation of some of its more doubtful or less known subdivisions. The question of the Sea-Serpent's existence had previously attracted the attention of several scientific men in Northern Europe; and my friend, the late Dr. Newmann, Bishop of Bergen, a man much and justly respected for his learning, research, and energy, made it the subject of enquiry within the last twenty or twenty-five years among his clergy and those of the dioceses. The amount of proof thus collected was sufficient to convince any one, however sceptical, as it is not mere hearsay evidence, but the testimony of known and respectable persons in various walks of life. One of the most striking statements is made by some fishermen, who saw the animal quite close to them, and of whom, one more hardy than the rest struck it with a boat-hook, upon which it immediately gave them chase; and, had they not been very near a small island or rock, on which they took refuge, in all probability they would have been destroyed.

"The size of the Sea-Serpents seen in the Norwegian fjords varies much; and I do not now remember what the dimensions of the largest are said to be. As far as I can tax my memory, none of them lately seen are larger than that described by Captain M'Quhae. The one seen by the fishermen alluded to was, I think, not above 70 feet long.

"There are, I believe, several varieties of the reptile known as the Sea-Serpent, but almost all the accounts agree as to the existence of a mane, and as to the great size of the eye. In several of the fossil reptiles somewhat approaching the Sea-Serpent in size and other characteristics, the orbit is very large, and in this respect, as well as in having short paws or flappers, the descriptions of the Northern Sea-Serpents agree with the supposed appearance of some of the antideluvian species. A great part of the disbelief in the existence of the Sea-Serpent has arisen from its being supposed to be the same animal as the Kraken, or rather from the names having been used indiscriminately.

"In concluding this hurried statement allow me to add my own testimony as to the existence of a large fish or reptile of cylindrical form (I will not say Sea-Serpent)."

The references made in this letter to the size of Sea-Serpents in the Norwegian fjords, easily leads to some speculation, as to the *motif* of the bow and stern ornaments carried by the dragons of the Vikings. Were or were they not attempts to portray Sea-Serpents that had been seen, or at least heard of, by the great Norwegian Naval Architect, Olaf Trygvason, who, according to a saga, built the *Long Serpent?*

J. C. ALLEN

A HATFUL

HINTS AND HELPS

FOR

HOME and GARDEN

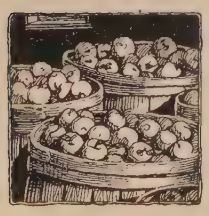
OCTOBER

FOR FLOWERING bulbs dig up the earth well in advance and mix well-rotted manure with the soil, allowing the bed to settle before actually planting. Before putting the bulb into the hole, place a little sand in the bottom to prevent any manure from coming into direct contact with the bulb. Massed planting usually gives more pleasing color effects than a thin scattering of bulbs around the garden.

Tulips, daffodils, and so forth, for flowering in the house should be carefully potted now. Excellent results are obtained by digging a trench about a foot deep in the garden, placing the pots in it, and covering them first with leaves and then with dirt. The leaves make the task of digging up after the ground is frozen much easier. This treatment supplies the bulbs with the right amount of moisture. Take them into the house from eight to ten weeks after the time of planting. Most bulbs, except freesias, must be kept in the dark to allow roots to form before plant begins to grow. Many people advise potting bulbs and putting them in the cellar while the roots are forming, but the danger of this method is that the bulbs may dry out. (See the article by Mr. McFarland in this issue for more detailed suggestions.)

* * *

Excelsior has been suggested as a covering for perennials. It does not get soggy and it can be dried out in the Spring and used another winter. The only difficulty is that it must be stored where there is no danger from fire.



* * *

When there is danger of frost, pick the unripe tomatoes and bring them into the house. If the vines are pulled up with them, their stored-up nourishment will ripen the tomatoes better.

* * *

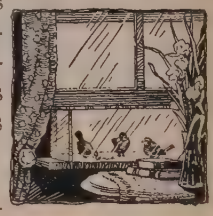
The goldfish should be brought into the house now. They have grown fat and large from their diet of natural food all summer. Do not overfeed them now. Every other day is often enough, for a goldfish never knows when to stop eating. You can still find a few earthworms in the gardens, which they will appreciate.

* * *

After the first hard frost dig up the dahlias and cut off the tops about 12 inches from the crowns. Dry them for two or three days and store them for the winter in sand, or other loose dry packing. The place chosen for storage should be cool and dry, but the temperature should be just above freezing, even during the coldest weather.

* * *

In storing apples remember that the fruit keeps on ripening after it has been brought in. A cool temperature retards the process and so keeps the apple in an edible condition longer than a warm temperature. Coolness also checks the growth of rots and molds, but actual freezing breaks down the tissues.



* * *

Fall planting of roses is excellent where the climate is not too severe, as it enables the rose-bush to take advantage of the first warm sunny days in late winter. If the new bushes are not severely pruned by the nurseryman before shipping, do it yourself. All the strength must be thrown into the roots for healthy growth before winter sets in.

When starting a new rose bed be sure to dig up the earth thoroughly to a depth of from 12 to 18 inches. Well rotted manure should be well mixed with the soil and good drainage made sure of. Roses are gross feeders and need a great deal of moisture, but they can not stand a soggy soil. In planting roses, avoid putting them near a large tree, as the tree roots take too much nourishment and moisture from the soil. A great deal of sunshine is also required.

* * *

For those who enjoy watching the birds in winter a recessed window box will give much pleasure. This can easily be made by raising or removing the lower sash of a window and constructing a glass inclosed seed tray on the inside of the window sill. Most birds do not seem to mind this intimacy if the ledge is extended a few inches on the outside of the window sill. They will light on the ledge and gradually feed inside, giving the effect that they are really in the room with you. These recessed feed boxes are, of course, well protected from the wind and have even been known to provide refuge for birds during winter storms.

* * *

Gather cat-tails and milkweed pods and even a spray or two of sumac to arrange with dried grasses in a tall vase. They make very artistic winter bouquets. One has the satisfaction of knowing that rare species are not being sacrificed, as a few of these can well be spared.

U. S. FOREST SERVICE

AN EXAMPLE OF "INTERCEPTION"
Much of the rain and snow that falls on a forest is caught and evaporated before it can reach the ground

The AIR *of the* FOREST

by Charles Fitzhugh Talman

Somebody has defined wood as "air solidified by sunshine." That is an epigrammatic way of saying that trees, like other green plants, obtain the greater part of their solid substance from the atmosphere through a chemical process in which the action of daylight plays an essential rôle. This process corresponds to eating and digestion in the economy of animals. Trees feed on air and they also breathe air. In the one case they draw upon it for carbon dioxide, from which they extract carbon, the chief element of plant tissues. In the other they inhale oxygen, use it, as animals do, in certain oxidizing processes that yield the energy needed for growth and other activities, and exhale, as a waste product, the same substance that serves them as food—carbon dioxide.

Trees get part of their water supply, in liquid or gaseous form, directly from the air. The rest is pumped up from the soil, but consists of water that was, at some earlier stage in its history, condensed out of the atmosphere. Nitrogen, without which no plant or animal can live, is supplied to the trees from the superabundant store of this gas contained in the atmosphere, though it reaches them by a roundabout route that takes it first into the soil. In short, except for a small amount of mineral matter that comes originally from the rocks, all the materials of which our woods and forests are made are gathered from that copious treasure-house of invisible blessings, the air.

Born of the air, the forest also passes its life in the air. Even the ground under the trees is permeated with air to the tips of the deepest roots. In a dry soil the empty space between its particles, amounting to from 35 to 50 per cent of its volume, is filled with air.

Physical changes in the air are reflected in the lives of the trees. Warm air stimulates growth; cold air checks it. Extremes of atmospheric heat and cold, moisture and aridity entail injury or death. Moving air aids in the propagation of trees by transporting their pollen and seeds. Pollen grains have been found floating in the air more than a dozen miles from the flowering tree, and the feathery seeds of the cottonwood have been drifted as far as nine miles. Unfortunately the same vehicle spreads disease in the forest by carrying the spores of fungi. Storms play havoc in the forest, as elsewhere. Snow, hail and sheathing ice—all products of the air—frequently shatter the trees or deform them.

Thus the forest depends upon the atmosphere for its existence and its well-being; but that is only one side of the story. The atmosphere is, in its turn, affected by the forest. So much can be said without danger of contradiction. When, however, one attempts to set forth in detail the nature and extent of the influences exerted by forests upon the air—or, in other words, upon weather and climate—the undertaking soon leads into the realm of controversy.

Some of these influences are beyond dispute. Forests break the force of the winds at the earth's surface, so that, on an average, calmer weather prevails within the

forest and in its immediate lee than elsewhere. Of the rain or snow that falls on a forest a considerable part is caught by the leaves and branches and subsequently evaporated, so that it never reaches the ground. In light showers the "interception," as this effect is called, may amount to 100 per cent; while the average for all rains, in the case of a dense forest, has been found to range from less than one-tenth to more than one-fourth of the rainfall.

On an average for the year the air of a forest in the temperate zone is slightly cooler—not more than a degree or so—than that of open country. In summer the forest air is generally a few degrees cooler than the air outside by day, and somewhat warmer than the air outside by night. The coolness of the air under the trees on hot summer days is often loosely ascribed to the effects of "shade," but shading is not necessarily a cooling process. A tin roof gives more shade than a canopy of leaves but does not afford a comfortable retreat beneath it from the heat of the sun. The roof grows hot and heats the underlying air, but the leaves remain cool on account of the active evaporation of water from their surfaces. At night evaporation from the leaves is checked, and is often replaced by the reverse process—the condensation of moisture from the air in the form of dew—which tends to keep the leaves warm. At the same time they serve as a screen which prevents the earth and the air beneath them from radiating their heat to the sky.

U. S. GEOLOGICAL SURVEY

TREE TRUNKS CURVED BY SNOW PRESSURE

A common effect on mountain slopes subject to heavy snowfall

The effects of forests upon the water-supply in their vicinity and on the flow of streams are extremely complex, and have been a subject of endless discussion. Some of these effects undoubtedly tend to conserve moisture, but on the other hand a forest during the period of active vegetation draws an enormous volume of water out of the ground and dissipates it in the air by evaporation. The general effect is to depress the level of the "water table" in the ground, so that the planting of trees is sometimes an effective method of draining swamps. The planting of eucalyptus trees in the Roman Campagna has dried up the breeding pools of mosquitoes and has thus diminished malaria.

Forest air is often credited with health-giving properties, which are explained in various ways. It was once generally supposed that the action of leaves in absorbing carbon dioxide and exhaling oxygen made the air of the forest more healthful. It appears, however, from the investigations of Ebermayer and others that the amount of oxygen thus provided is insignificant in proportion to the needs of human respiration, besides being largely offset by the increased amount of carbon dioxide due to the decay of organic matter in the forest litter. The belief that the air about pines and other conifers is beneficial to consumptives has prevailed for ages. As long ago as the days of the Caesars Roman physicians were wont to send consumptive patients to the pine woods, the therapeutic virtues of which are ex-

WHAT SNOW DID TO THE BEECHES

Young trees loaded with snow while still in full leaf. Many will eventually grow erect

tolled by Pliny. The well-known odor of such trees is due to a volatile oil, allied to turpentine, contained in their leaves, and some justification of the old belief appears to be found in the fact that turpentine, even in minute quantities, stimulates the action of the phagocytes, or white blood-corpuscles, which devour bacteria. Whether or not pine forests exercise the special effects attributed to them, it is certain that the air of forests in general is relatively free from dust and from the microbes of disease. Observations in one locality showed the number of bacteria of all kinds in the atmosphere of a forest to be only from one-twentieth to one-thirtieth the number found on its outskirts.

U. S. FOREST SERVICE

MEMENTO OF A BYGONE CATASTROPHE

Track of the celebrated Chattanooga snowslide in the Durango Forest, Colorado

That forests exert far-reaching effects upon climate and that deforestation brings about striking climatic changes are twin theses that have had a host of champions, in and out of the scientific world, especially since the reckless felling of forests began in France in the days of the French Revolution. Among the extreme views that have been expressed on this subject is the notion that the clearing of forests in America has upset the climate of Europe; owing to the fact that storms headed for the Old World now get a better start than they formerly did because they are no longer impeded by forests in sweeping over our country. This idea, and many others akin to it, ignores the great depth of the air currents involved in storms as compared with the height of a forest, and especially the enormous energy of storms and other large atmospheric movements in comparison with any influence a forest might be expected to have upon them by virtue of its conditions of temperature and moisture.

Since the great controversy over forest influences began meteorological stations have multiplied throughout the world, and in many places stations have been established for the special purpose of comparing conditions in the forest with those prevailing elsewhere—a plan that was once advocated in a formal scientific paper presented to the Royal Society of Edinburgh by Robert Louis Stevenson. Thus the speculations of former times have been replaced by a good deal of definite information; yet the question of the climatic effects of forests remains, to some extent, an open one, with the tendency at present to regard these effects as not very different from those due to other kinds of vegetable cover.

Whether or not forests exercise any marked control over climate, there is no doubt that climate largely determines the growth of forests, the distribution of which over the earth, except where they have been removed by man, is closely related to the distribution of climatic conditions; chiefly rainfall and temperature. Trees of different species differ greatly in their demands for heat and moisture, but there are limits of both beyond which none of them will thrive. The "timber-line," marking the extreme altitude reached by trees on a mountain, is fixed

U. S. FOREST SERVICE

WHERE A HURRICANE SWEPT THE FOREST

Sylvan monarchs laid low by the great Olympic Blowdown of January, 1921, the worst storm in the history of American forests

partly by winds, as affecting the rate at which the trees lose water by transpiration.

There are several more tangible effects of forest air and weather on trees that greatly concern the forester. Hot, dry weather is the worst of all enemies to young trees and is a menace to the forest in general through its action in increasing the danger of fire. Hot sunshine often scorches and cracks the bark of trees and leads to extensive decay. The frosts of late spring and early autumn nip the tender parts of trees, as they do those of other vegetation. The sudden onset of intense cold in winter sometimes causes the bark and outer woody layers of a tree to shrink more rapidly than the interior, producing ridges and cracks that impair the quality of the timber. The alternate freezing and thawing of the ground uproots many seedlings by the process of "frost-heaving."

U. S. GEOLOGICAL SURVEY

A TIMBER-LINE TREE IN THE ROCKIES

Showing the effect of predominant westerly winds. Long's Peak, Colorado

Snow on the ground is a protection to the roots of trees, as it prevents the deep freezing that would cut off their water-supply, but the pressure of snow lying on steep slopes often deforms the stems of young trees and leaves them permanently curved, and snow-slides carve broad paths on wooded mountainsides. Branches and whole trees are sometimes broken down by loads of snow; especially wet snow falling before the broadleaf trees have shed their foliage. "Snowbreak," as this effect is called, is one of the recurrent disasters of the forest. In January and February, 1844, more than two million trees were thus destroyed in the forests of Hanover, Germany, and in January, 1884, snow broke down 22,500,000 cubic feet of timber in the same region.

In this country ice storms cause more breakage of trees than snow. The moisture in these storms falls as rain and forms a coating of ice on limbs and branches, often weighing several tons on a tree of average size. The devastation is sometimes equal to that caused by forest fire. Hail often does extensive damage in the forest. The wounds inflicted by snow, ice and hail all have the secondary effect of giving access to fungus and insect enemies.

Lightning takes its toll of the forest. Besides shattering individual trees it is responsible for many forest fires; especially in regions where, as in much of the western United States, "dry" thunderstorms supply no rain to check the spread of the flames.

"Windfall" is a commonplace in the life of the forest; ranging in degree from a moderate pruning, which may be generally beneficial, to catastrophes of spectacular proportions. Some of these events are famous in the annals of forestry. Thus a single storm in November, 1893, blew down 1,850,000 trees in two counties of Scotland. Of more recent memory is the unprecedented disaster that overtook the Olympic Peninsula of western Washington on January 29, 1921. Sweeping over a forest of large trees this veritable hurricane felled eight billion board feet of valuable timber; an amount equal to about one-fifth of the annual consumption of wood in the United States. The site of the "Olympic Blowdown," as this storm has been called, remains to this day a scene of appalling devastation, and the débris of broken timber is still potential food for forest fires.

INTEREST AND BOREDOM

PHOTOGRAPHS BY H. ARMSTRONG ROBERTS

HARVESTING THE LADYBIRD BEETLES
Sought out in their mountain wintering places, they were gathered and sifted into containers

LADYBIRD FIGHTS ON OUR SIDE

by William Atherton Du Puy

HERE is an event in American natural history, largely lost sight of, which is entitled to rank in importance in its field about on a par with that romantic venture in political history, the war with the pirates of Tripoli. Each had its effect on American trade and prosperity. Each had its elements of thrill and interest—the one of grappling irons and cutlasses, the other of a strange marshalling of insect armies to fight the battles of man.

This natural history event was an actual foreign invasion. The enemy was an insect that threatened death to all orange trees. It was called the white scale, was a sort of mealybug, and came from Australia about forty years ago. It was a stowaway on imported orange trees.

These scales are white aggregations of tiny insects that are cousins to the aphids that inhabit the rose bushes in many gardens. They are sap suckers. They run around merrily when they are young but the women folks, having once bored into the sap streams of a tree and established a food supply, shed their legs and eyes and settle down to a quiet life given to drinking sap and rearing families. For purposes of housing they secrete a sort of wax from their bodies. It is because of this froth of wax that they are called white or fluted scale. When they become sufficiently numerous they drink all the sap that an orange tree produces and, having no nourishment for its own body, it dies.

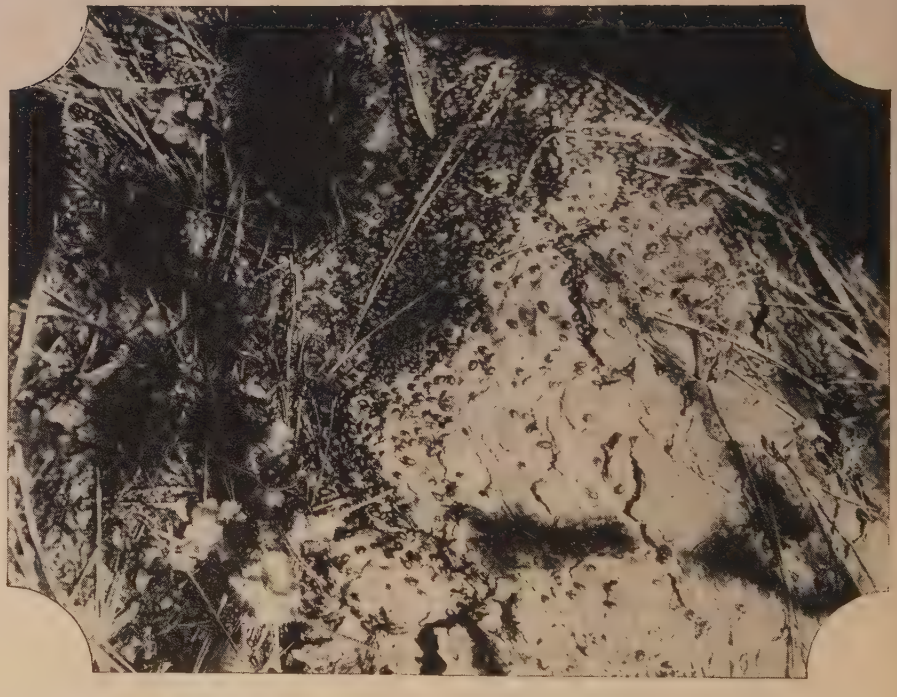
A GOOD IMMIGRANT
The Australian ladybird that fights the orange scale

In California in 1891 the orange trees were thus being done to death. Men of science were called in. They traced the scale to its place of origin in Australia. Strangely it seemed to be doing little harm to the orange trees over there. These entomologists, wise in the ways of insects, thought they knew why. There must be a natural enemy of the scale in Australia, they said, that holds it in check. That enemy had not come with it to California.

When they found this enemy it looked for all the world like the mild little ladybird beetle who, in the nursery rhymes, is warned of a conflagration in her home. She was in fact almost exactly like some American ladybirds except for a different color pattern on her back and a peculiarity of appetite, the insistence on eating nothing but white scale. She was a very close relative to the American ladybird and possessed of a similar disposition to be helpful to man. She had lived there in Australia and, through the ages, had fed on the mealybug scale and held it in check.

This Australian ladybird was introduced into California. She was released in the orchards where the scale insects of her native land, in the absence of her restraining influence, had grown abundant beyond anything she had ever known.

(Above) A BAD LADYBIRD
Larva and adults of the bean beetle busily feeding



(Right) THE WINTERING PLACE
Ladybird beetles found among the pine needles in swarms

It is a law of Nature that animals increase their output of young ones in the presence of an abundant food supply. These foreign ladybirds put on a demonstration of this law. Each one of them turned to and laid herself three hundred eggs every one of which, under these favorable circumstances, was likely to prosper. They came to maturity quickly and the one hundred and fifty young females each laid three hundred eggs. So rapidly does this sort of multiplication pile up that the scientists figured that, in five months, one female might have produced seventy-five billion devouring offspring. Certain it is that, within a year, the turtle-backed immigrants from Australia were plentiful throughout the orange groves of California, had the mealybug scale under control, and the trees were again bearing fruit.

The odd thing about this campaign was the fact that the ladybirds so successfully wiped out the mealybugs that, knowing no other food, they had nothing to eat and most of them starved to death. The scientists, however, were anxious to maintain the supply of this helpful insect against the recurrence of scale outbreak and so sought ways to keep colonies of them going. Since they would eat only scale insects these had to be kept alive to grow food for the ladybirds. It was found that the scale would thrive on potato sprouts. Today in Sacramento a colony of scale is kept going on this food and fed to another colony of these Australian ladybirds.

Thus, whenever there is an outbreak, there are reserves ready to rush to the scene of infection. The existence of this rescue squad has become known the world around and now and again a call arrives from Italy, India, South Africa, or elsewhere, and is answered by Sacramento. These fighting ladies are as willing as Marines to rush to the scene of conflict.

ONE DRESS PATTERN
Some ladybirds affect this type of marking

This group of sapsuckers that attacks the orange trees has scores of cousins with similar habits that drink of the lifeblood of other plants. Similarly this group of ladybirds has scores of relatives with appetites specially developed for fattening upon them. Every Spring, everywhere the sap suckers come out early and begin their processes of multiplication. So rapidly do the generations follow one another that it begins to appear, along about May, as though they would overrun the world. As a matter of fact, if they went unchecked through a single Summer

season, a great blight would seize all vegetation.

But before long their enemies begin the backfire. As the Australian ladybird held the white scale in check in that country, so are there other ladybirds with appetites for special sorts of sapsuckers that operate quite generally throughout the land. Go into your own garden and examine those rose bushes that are likely to be the special food plant of aphids. If the season is as far along as June the little ladybirds with the black backs with red spots are likely to be found to be quite abundant. These ladybirds are among your best friends. They are there to save your garden. Without them it would be dry and barren before long. They are working very industriously at their task. The aphid forces got the start on them but just now they are gaining. By mid-summer they

(Above) PACKING UP THE HARVEST
Ladybirds being placed in screened containers to be taken to the farm

(Left) WHAT THE BEETLES EAT
The orange scale that the Australian beetles were brought in to destroy

are likely to have won the dominance. Beyond that time, because of them, the sapsuckers tend to languish. They have been eaten into submission.

This helpful little ladybird, if one gets interested in her, wants to know whence she came, what are her antecedents, her family connections, develops a rather surprising personality. First of all it is found that she is a beetle. The great orders among insects are named this or that because of the peculiarities of their wings. They mostly have Greek names that are descriptive of their wings. Thus the moths and butterflies are called, in Greek, scalewings. The cockroaches are called straightwings, the bees are called membrane wings, and so on. The beetles are called Coleoptera, which means sheathwings, because of the hard, bone-like nature of their outer wings. The

ANOTHER DESIGN
There are many and varied kinds of marking

ladybird has these wings, thus identifying them.

There are eleven thousand kinds of beetles and many of them are man's direst enemies. The ladybird stands almost alone among beetles as a friend of man. Yet so good and helpful a friend is she that she comes near making amends for the offences of all her relatives.

Take the boll weevil, for instance, that has entered the lists against no less a person than Uncle Samuel himself, has invaded the cotton lands, has advanced its posts year after year until it has covered the South. It is a beetle.

Take the tiny pine beetle, little bigger than the point of a pencil. It goes into the big forests, drills to the inner bark of some giant pine, and burrows around the trunk, cutting the channels connecting the leaves and the roots. The forest monarch develops the "red top." It is the sign of death. A tiny member of the sheathwing family has given it the thumbs down.

Take the Japanese beetle, brought into New Jersey some years ago on the roots of an imported iris. It is spreading every year in a circle of increasing radius. Its grubs lie at the grass roots of lawns and golf courses. They cut those roots so smoothly that dead turf may be rolled back like a blanket. They transform into lusty beetles, fly away to orchards and corn fields and devour all before them.

There is the bean beetle, the potato bug, the weevil that gets in the corn meal,

the powder post beetle that bores into furniture or the timbers of a house, and hundreds of others whose augers are turned against man. But the ladybird is his helper and loyal good friend.

For generations the gardeners of Europe have known that the ladybird is a friend of the plants they grow. It has long been the habit over there, when certain plants were attacked by aphids, to gather up the little spotted-backed hemispheres here and there and concentrate them on the suffering plant. Undoubtedly this has been helpful but the degree to which this act of man supplemented Nature is hard to measure.

It remained for the State of California, after her success in battling the orange scale, to apply in a larger way this European idea of moving her friendly insect forces about. In California the growing of cantaloupes is a large industry. Farms given over to them may stretch away for miles in an unbroken prospect. And cantaloupes are particularly given to attacks by aphids. It sometimes happens that these farms are blighted as though a fire had swept them.

There are many ladybirds in these California valleys but it often happens that they do not arrive on the cantaloupe farms in sufficient force and sufficiently early to prevent their devastation. The California State Commission of Horticulture has taken deliberate thought and action to hasten this arrival and concentration.

These polkadot beetles summer in the lowlands, feed on aphids and multiply. As the Autumn comes on they unfurl their wings and take flight into the mountains. Thus they seem to follow a rather foolish program of summering where hottest and wintering where coldest.

The entomologists of California followed the ladybirds into the mountains in the Autumn and studied their habits. They found that they were given to wintering in colonies among the pine needles beneath the snow. The study had not gone far before it developed a specialist. This individual was one Ed Brannagan, a man of the mountains. He was probably the first professional ladybird harvester in all the world. Brannagan knew the back country, the lay of the land, the few isolated ranches in these parts. And above all he had a sense of location that was instinctive.

This ladybird collector followed his peculiar game into the high mountains in the Autumn. He knew their peculiar habit of concentrating in large colonies in damp places near water where there were plenty of pine needles and going to sleep for the winter. Soon a blanket of snow would cover them and their troubles would be over for four or five months.

When the Springtime came and the snow melted the ladybirds felt the stir of life. Brannagan's contacts in the mountains kept him posted on the retreat of the snow-line. When it had reached his ladybird caches he was up and at them. He started for the mountains with many crates about the size of those in which strawberries are packed. These went as far up the mountain as a truck could climb. Pack mules carried the parties for the next stage. Finally the going might become so steep that only men on foot could make it.

Brannagan went to the colonies of ladybirds he had located in the Autumn as a dog goes back to a bone he has buried. The habits of these insects are such that it would seem that Nature had intended that they should be harvested by man. After the snow is gone and the warmth of the Spring sun begins to be felt, they bestir themselves in the middle of the day, scatter over the hillsides in search of food. But in the cool of the evening they return to the sleeping grounds. They wait for the sun to warm them in the morning before they stir again. This program is kept up for a month before they finally abandon their winter quarters.

The ladybird harvesters found that their opportunity lay in working in the early mornings. With dust pans and whisk brooms they swept up the dormant insects. They even put them through a machine which screened out the trash and pine needles. The ladybirds then went into bags and were packed to camp. When there were enough of them they were packed on mules and made the next stage of their journey. Here the trucks and crates awaited them. They were packed with damp excelsior, two or three quarts of them in one of these boxes with screen over the end for purposes of ventilation. They were shipped to headquarters down at Sacramento. Literally tons of them piled up here. They were kept in cool, damp places or in refrigeration where they went back to sleep thinking it was still Winter.

At just the right time they were shipped to farmers, mostly in Imperial Valley where early cantaloupes are an important crop. A crate of ladybirds was supposed to be enough to take care of a ten-acre patch. At times, however, great shipments went into certain regions in attempts to blot out the aphid plague.

These experiments went on for a number of years but were finally discontinued through disputes over who should pay for the service. The authorities are not sure of the practicality of the results. It seemed at one time that a new industry under the sun was close to being established. It looked as though it might come to pass that ladybirds should be gathered commercially, kept in cold storage, and sold to customers anywhere whose gardens were being attacked by aphids. It may yet work out that the householder with a small garden shall, when he buys his seed in the Spring, ask also for a half pint of refrigerated ladybirds and release them for an early start in the race with the sapsuckers that hurt plants.

Another article by Dallas Lore Sharp will be found in the November issue of Nature Magazine. Needless to say it is delightfully written and carries a thought that is worth pondering. Dr. Sharp will discuss the wild life sanctuary as an important,—yes, an essential,—part of our life. He does so in a most entertaining fashion. There are more of his articles to come, also.

Franconia Notch Sawed or Saved?

"THE GREAT STONE FACE"

by Richard Wilbur Westwood

SHALL the axe swing and trees fall at the feet of the Old Man of the Mountain? Shall sawmills whine in the valley of Franconia Notch? Shall one of the most beautiful scenic spots in all the world yield its birthright of beauty for so much per board foot?

These are questions that must soon be answered because this glorious spot in the White Mountains is to be saved or sawed before many months have passed. For a century now this beauty spot in the White Mountains of New Hampshire has drawn visitors and admirers from all the corners of the world. All have taken away with them a deep appreciation of the glory that Nature here wrought and that man has not thus far seriously damaged. The Daniel Webster Highway from Boston to Bretton Woods, carries the tourist into Franconia Notch. To all, probably, the most interesting sight is the "Great Stone Face," immortalized by Hawthorne, majestically peering through the clouds far above beau-

ALONG THE DANIEL WEBSTER HIGHWAY THROUGH FRANCONIA NOTCH

PROFILE LAKE AND EAGLE CLIFF

tiful Profile Lake. Then, too, there is the Flume, carved by ages of water through the solid rock of the hills. There is lovely Echo Lake, the mirroring Basin and the Pool, while on the shoulder of Cannon Mountain, in the strong embrace of other mountains, lies Lonesome Lake in its serene and sequestered beauty.

For those who seek the trail afoot with pack on back, the mountains about the Notch are laced with woodland trails. Along Liberty, Lincoln and Lafayette Mountains runs the Franconia Sky-Line Trail, from which one gazes upon the full glory of the White and Green Mountains and casts a glance over into Maine. This is a part of the Maine-Georgia Trail being fostered by hiking groups and it is fed by many trails of the Appalachian Mountain Club, with their shelters. Mount Lafayette, overshadowing the Notch, has been selected as a site for one of the best of the Club's shelters.

On either side of the Notch, in fact virtually hemming it in, is the White Mountain National Forest of 464,000 acres acquired under the Weeks Law. This, of course, enjoys a guarantee against destructive lumbering such as would be inevitable were Franconia Notch doomed to the sawmill.

For fifty years the Notch, the glorious Profile, the Flume and the lovely lakes have been privately-owned and operated. The Profile House was long a popular hostelry whose register was inscribed with many famous names. At the height of the 1923 season, however, flames leveled the Profile House and it has never been rebuilt. Lumbermen cast envious eyes upon the six thousand acres with their fine covering of spruce, some of it primeval. And so the issue was drawn,—saw or save this beauty spot?

The natural leader in the movement to save is the Society for the Protection of New Hampshire Forests, which during the twenty-six years of its useful existence has acquired for posterity twelve beautiful reservations, has furthered the rebuilding of the forest assets of New Hampshire and fostered the establishment of National Forests in that State. The Society has set about to avert the inrush of the sawmills into the Notch.

To the Legislature of New Hampshire the friends and lovers of Franconia Notch went and found response. A unanimous vote was recorded for an appropriation of $200,000 toward the acquisition of Franconia Notch and the Profile, which is the State's "trademark". This would not pay the price the owners asked. With his will, the late James J. Storrow left a memorandum requesting his executors to allot $100,000 toward the acquisition of the Notch. His son, James J. Storrow, Jr., has taken over his father's office of treasurer of

(Continued on page 256)

A VISTA ACROSS ECHO LAKE

A PART OF THE THREATENED FOREST

Seven Homes; No Tenants

Did Bachelor Phoebe Build Unique Block of Row Houses?

by Paul Kaufman

THE PHOEBE'S SEVEN ROW HOUSES
The eggs are put in merely to give definition to the hollows of the nests

It was early in September, when peering casually into the workshed of an abandoned nursery in Norwich, Connecticut, I caught my first glimpse of the most extraordinary edifice perhaps ever recorded in the annals of birddom. There, along a stringer about four feet from the ground was a strip of seven nests. There they were, not separate but all perfectly interwoven and one single construction.

"Come here," I called excitedly to my friends outside, and as they gathered about the door, I demanded, "Did you ever see anything like this before? Did you ever hear of such a thing?"

No, they agreed with astonishment, they never had. A new building development and a complete row of attractive homes with all modern improvements inviting seven happy families!

With all the pride of discovery I carefully detached my prize so as not to disturb the mud-plastered foundation and back walls, and in triumph I bore it back to the city as my vacation trophy. It was worth a whole summer of exploration; worthy of the patient search of an Audubon, and deserving no credit for the find, I only regret that a great ornithologist could not have won such a reward.

Within a few days the records were searched and experts invited into council. All available knowledge rendered the one verdict: this formation is hitherto unknown in the history of the bird world. Several species of our feathered friends not infrequently build more than one nest in close proximity. Swallows sometimes erect vertical tiers in the cliffs. But a continuous single row, not of two or three, but of seven—that achievement, according to the annals of human observation, is unique.

L. W. BROWNELL

MEALTIME WITH THE PHOEBE FAMILY
This family, however, used a nest and suffered no mating disappointments

Unless by some miracle I discover the creator in the act of repeating his performance next summer, I shall never see him. Yet he has left the indelible signature, *Sayornis phoebe,* or more familiarly, Phoebe Bird. Outwardly I know him well, for his fellows return to a hospitable residence on the inner corner of my porch year after year. And who does not know his tribe? Together with the wrens,

the phoebes share the distinction of being the most companionable with human beings. Coming among the first advance guard in March and leaving among the last in late October they deliberately seek to dwell close to men, thus winning protection from their natural enemies, hawks and owls, as well as from predatory animals. My own phoebes court intimacy with me by flitting down to my wheelbarrow as I work about the yard, and they fly about twitching their tails in friendly greeting as I sit reading in the porch hammock. They are not endowed with song notes, but their two-syllabled call, *pewit, phoebe, phoebe—pewit, phoebe,* from which we have named this branch of the fly-catcher family, wins our hearts with its gently plaintive appeal.

"Common summer residents—highly domestic" runs the usual description of them all. But this is the story of a most uncommon representative of his race, domestic beyond belief. In these seven nests, seven-and-twenty inches long, is written more than the artist's signature. As in the creation of every honest artist, the inner experience of the individual builder is wrought into these cunningly woven strands of grass. And what is the story back of it. We must rely on guess,—so you may accept my theory that follows, or make your own.

PAUL G. HOWES

A TYPICAL PHOEBE HOME

This one is of the orthodox variety,—a detached house

Can we divine the secret of that urge which stirred this original expression of some inner tumult? All of his story we cannot know, yet much is spelled out in the very texture of his work, and the rest we can guess. Careful scrutiny reveals that the whole structure is new, that it is wrought all of the same simple materials, and that none of the little homes was ever occupied. No tiny feathers, no bits of shell, no stains.

And why? What happened to the toiler? Did he meet some untimely end? At least he lived to finish the work of seven ordinary seasons. Then why no signs of a mate? Because, we must conclude, he had none. Long, perhaps, he waited for one who never came. Or perhaps soon after her arrival she herself was overtaken by some rude fate. In any case our lone phoebe built on and on in blind desperation. We humans call it thwarted love in ourselves. In Nature we call it brute instinct.

Almost uncannily our American poet Lowell in his verses on the phoebe appears to have anticipated a scene from the very drama which I am here suggesting:

It calls and listens; Earth and sky,
Hushed by the pathos of its fate,
Listen: no whisper of reply
Comes from its doom-dissevered mate.

Phoebe! is all it has to say
In plaintive cadence o'er and o'er,
Like children that have lost their way,
And know their names, but nothing more.

But our phoebe did more than lament in love-lorn strain. Not gifted, as Matthew Arnold describes the nightingale, with the power to pour forth "eternal passion, eternal pain," he could still pour out the yearning in the only way he knew. Perhaps he strove to win another mate. But none came to share his seven homes.

Why he did not follow the way of all other birds and build his separate nests no human wisdom can explain. Was he influenced by modern methods of construction and by the high cost of building in the human world? Or did instinct teach that both energy and materials could be conserved by using the same side-wall for two houses? At all events let us hope that the birds will not follow this human precedent of overcrowding. There is room enough for all the "detached" homes they want to build. I cannot believe that either birds or men were intended to live in apartment houses. But if the phoebes must change their domestic habits in imitation of us we can hope that they will never be afflicted with our domestic difficulties. Next summer, I hope, my lone phoebe will find his true mate, if this he lacked.

Franconia Notch—Sawed or Saved?

(Continued from page 254)

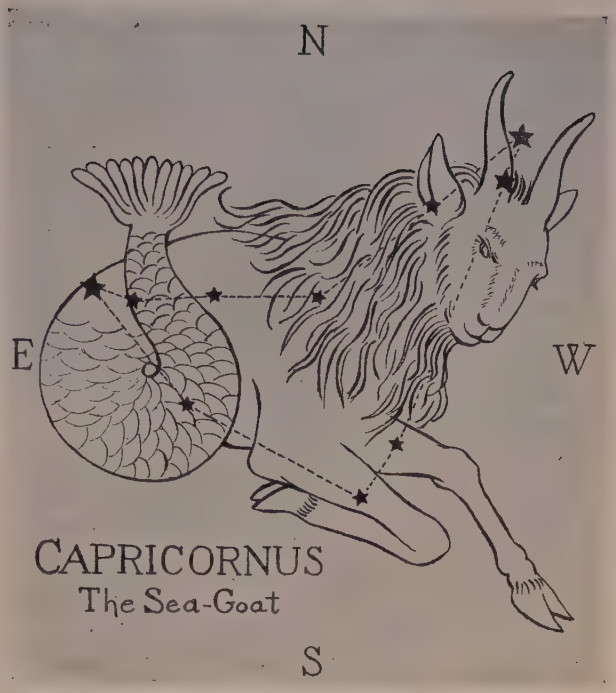
the Society and his interest in its work. The Society is seeking to raise two hundred thousand dollars to save the Notch. Those who have the purchase in hand find one hundred thousand fine old trees on the property. Anyone may buy one or more of these at one dollar each. He may identify it and possess it where it stands and may do with it what he likes save cut or mutilate it.

Once acquired, the title to the property will rest with the State of New Hampshire. It will, however, be managed by a joint committee of the State and the Society, thus guaranteeing honest management and freedom from political control. The Flume will be operated with an admission charge as before, the revenue being devoted to the upkeep of the property.

So, through its friends and with the help of those who love this spot that Nature folded into the Franconia Mountain; who find inspiration in the craggy profile she has carved on the mountain's face; who joy in the serene beauty of Lonesome, Profile and Echo Lakes; who marvel at the fashioning of the Flume, Franconia Notch gives promise of being saved from axe and saw.

The Sea-Goat and the October Skies

By Isabel M. Lewis



OUR CONSTELLATION FOR OCTOBER
There is an interesting ancient legend surrounding this mythological figure

CAPRICORNUS, the Sea-Goat, is the eleventh of the zodiacal constellations and will be found between Sagittarius, The Archer, on the west, and Aquarius, the Water-bearer, on the east. In ancient times the winter solstice was located in this constellation but it has now shifted thirty degrees westward into Sagittarius. As this marks the point where the sun ends its apparent southward journey and starts northward and begins to ascend the heavens once more, some ancient writers suggested that the constellation in which the winter solstice was located was given the name of Capricornus, the Goat, because of this animal's inclination to climb to lofty heights. As it happens, though, Capricornus is a Sea-Goat with the head of a goat and the tail of a fish. The legend has it that when the giants drove the gods from Mount Olympus they took refuge in Egypt and disguised themselves in the form of animals. Pan took the form of a goat, but when the fire-eating monster, Typhon, attacked him he leaped in terror into the River Nile and changed into a Sea-Goat.

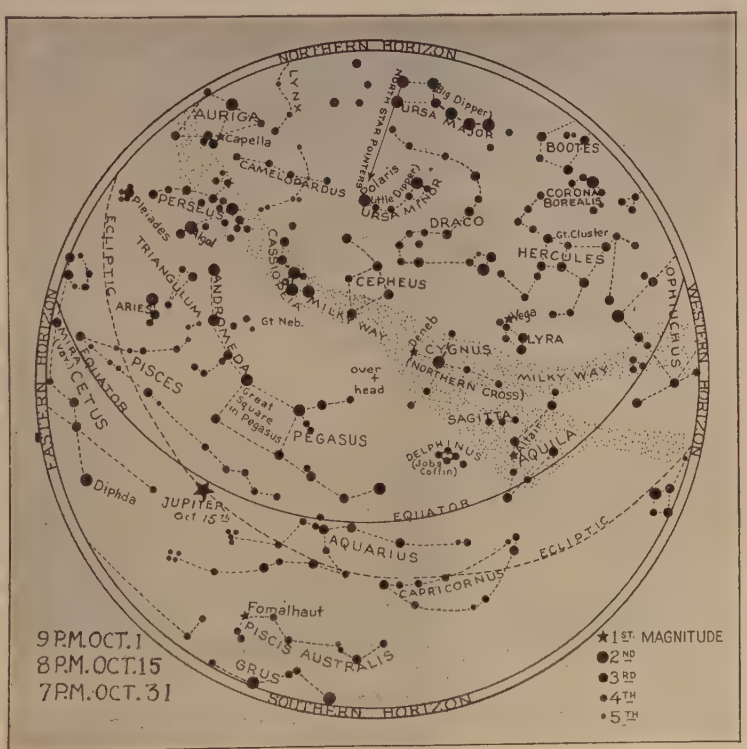
It was the idea of the Chaldean and Platonic philosophers that the "gate of the gods" was located in Capricornus and that through this gate souls released by death returned to heaven, while through the "gate of men" in the constellation of Cancer, souls descended from heaven into the bodies of men. The positions of these two "gates" corresponded to the positions of the two solstices, winter and summer respectively.

Capricornus is not a conspicuous constellation and contains no star brighter than the third magnitude. It is best located by its position with reference to neighboring groups. It lies south of Aquila and Delphinus and directly beneath the western portions of Aquarius and northwest of the Southern Fish, Pisces Australis, which contains the first magnitude star, Fomalhaut, the Fish's Mouth. At this time Fomalhaut will be found in the southeastern sky, and Capricornus, directly west of the meridian and low in the south.

The chief object of interest in Capricornus is the star Alpha Capricorni, at the base of the horns of the Goat, which is one of the "naked eye" double stars, that is, it can be seen to be made up of two stars close together even without the aid of a telescope. Another one of these wide double stars plainly visible to the naked eye, it may be remembered, is the star Nizar at the bend of the handle of the Big Dipper. The name of the little companion star of Nizar is Alcor and the two are often referred to as The Horse and His Rider.

Alpha Capricorni lies in the extreme western part of the constellation a short distance due north of Beta Capricorni which is a star of the third magnitude and the brightest star in the constellation.

The southern heavens this month contain few bright stars. Fomalhaut, one of the twenty brightest stars in the heavens and distant from the earth only twenty-five light years, is the only



TO USE HOLD OVER HEAD WITH TOP TOWARD NORTH

conspicuous star in this barren region between the celestial equator and the southern horizon.

In the western sky, though, we have the beautiful Vega, in Lyra, and Altair in Aquila, as well as the first magnitude star Deneb Cygni atop the northern Cross.

The Big Dipper now rests almost upon the northern horizon and so is in its most unfavorable position for observation, while Cassiopeia and Cepheus, the royal pair, are high in the northern sky.

Andromeda, The Woman Chained, and Perseus, The Hero, coming to her rescue on his winged steed, Pegasus, lie to the south and east of Cassiopeia. The Great Square and the head and forelegs of Pegasus now directly east of the meridian occupy a huge area in this part of the heavens. South of Cygnus and east of Aquila and due west of Pegasus lies the little diamond-shaped group known as Delphinus, the Dolphin, or also as Job's Coffin.

Among the planets, Jupiter and Saturn are conspicuous in the evening sky, while Venus is a glorious object in the east before sunrise. Mercury reaches its greatest eastern elongation on the eighteenth of the month when it will be nearly twenty-five degrees due east of the sun. Its altitude above the horizon is so low at this time, however, that it will be very difficult to find it in the evening twilight. The fall is not a good time to observe this planet in the evening as the ecliptic, near which the planet is always to be found, then makes a very small angle with the western horizon. It may be possible to find the planet on or near this date, with the aid of a field-glass, very low in the southwest in the twilight.

Saturn is in Scorpio and is now visible for a little over two hours after sunset in the southwest. Jupiter will be found in Pisces in the southeast in the early evening and will be visible most of the night. It is now a magnificent object far outshining any other stellar object.

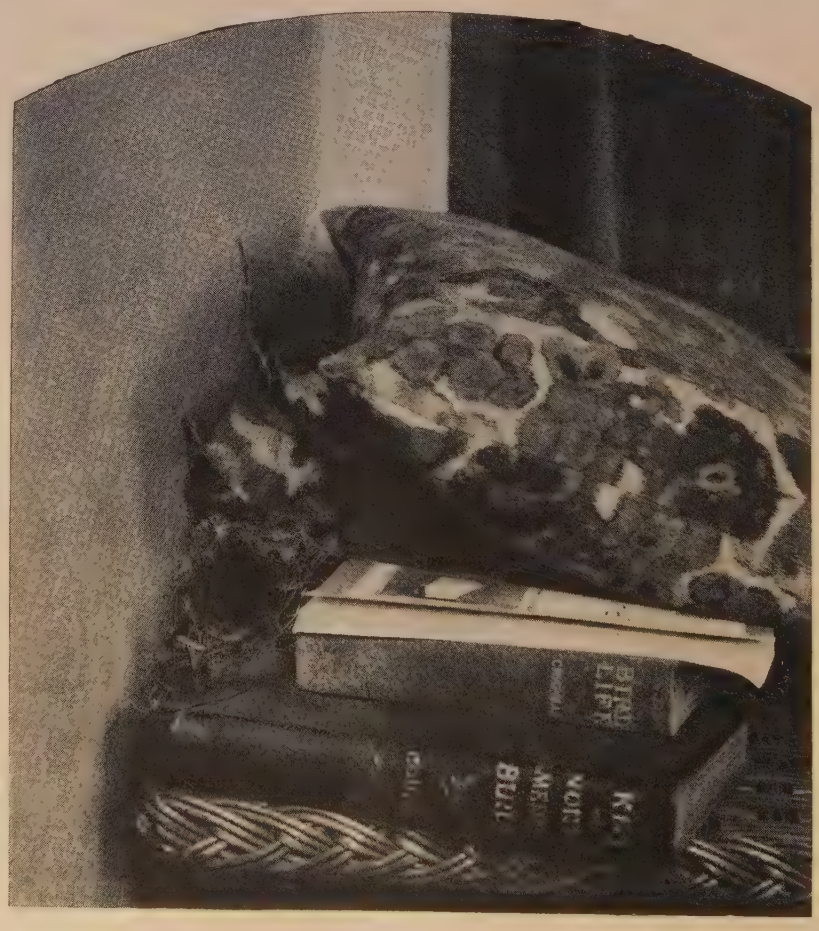
Venus may now be seen as a beautiful morning star in the eastern sky before sunrise. On the seventeenth it attains its greatest brilliancy and is so bright that it can easily be seen in broad daylight. On the twenty-first it comes into conjunction with the moon when it will be nearly eight degrees due south of it. An excellent way to find the planet in daylight on that date is to locate the moon in the daytime and then search for Venus a little to the south of it. With this aid it should not be a difficult matter to pick it up. Mars comes into conjunction with the sun on the twentieth so will be lost.

A WISE WREN

by Charles N. Tunnell

To the general public, Judge R. L. Batts of Austin, Texas, is a well-known lawyer of the state. To students of bird life and to Texas birds, Judge Batts is not only an authority on birds, but he is a friend to birds.

Few environments are more inviting to the bird kingdom than the beautiful home and gardens of the Batts home. It was probably these surroundings that first attracted the attention of a little Texas wren who was seeking a suitable place for her nest. It appears that this wren reasoned that any man who loved flowers and Nature as this man did would also love birds. A more detailed investigation of the place convinced the wren that her reasoning was sound. On the sun porch to the home, she found two books and a magazine lying on a wicker table. The magazine concerned the life and habits of birds. The title of one of the books was "Bird Life," by Chapman, the second book was "Key to North American Birds," by Coues.



DID THE WREN REASON?

At least she selected a homesite that gave every evidence of an interest in her kind

All of this furnished more proof to the wren that her reasoning was faultless; therefore her nest was soon finished at the end of the books on bird life and under some sofa pillows. True to her reasoning, she had found a friend in Judge Batts. Cats received a cool welcome and the little wren was permitted to hatch her little ones in this congenial environment.

The ROMANCE of ANDRÉ MICHAUX

by

Donald C. Peattie

Illustrated by Garnet Jex

IN MICHAUX'S GARDEN

Live oaks and Spanish moss at Ten Mile Station near Charleston, S. C.

On the historic ground between the Tigris and the Euphrates that was once the Garden of Eden and is now an arid waste, a party of Arab horsemen stood in a circle around a young Frenchman, uncertain whether to shoot him in the back or cut his throat. They had already taken his horse, his money, and his saddlebags, having thrown out on the sands his microscope and botanical books as certainly of no use to Bedouin marauders. The young man, André Michaux, was sure, too, that his hour had come, and stood stoically awaiting his fate. Shouts were heard and a party of horsemen rode up. From their midst advanced the English consul, clothed in the majesty of his ambassadorial inviolability. He took the helpless young naturalist under his guidance, and so saved the life of a man who, though he never guessed it then, was to explore America from Hudson's Bay to Florida and west to the Mississippi, the most romantic figure in all the stories of early American naturalists.

Michaux proceeded to Teheran in Persia, and there he cured the Shah of a strange malady. Thereafter, with the protection of the ruler of Persia, and an expert knowledge of the language, Michaux explored the mysterious land around the Caspian Sea, sending home to France a beautiful collection of Oriental plants. He was laying plans for a second visit to the Orient when his king, Louis XVI, sent him to America to gather seeds of our finest native trees. Though disappointed in being sent to such a barbaric and inhospitable country as America seemed in the year 1785, thither he came, accompanied by his little son. First he visited New York and started a garden there, but later he removed to Charleston where he established a famous garden the remains of which may still be seen. A few trees planted by his hand grow there to this day, and here he transplanted from the Old World some of the ornamental trees that still make beautiful southern gardens,—the China-berry, the mimosa, the tallow tree, and many others. He was the first man ever to grow tea plants in the New World, and ever since then South Carolina has raised tea. He it was who taught the mountaineers to gather ginseng and prepare it for sale in China, where it is in enormous demand; and he it was who sent back to France the loveliest of American trees and shrubs—the locust, the rhododendron and azalea, and the tulip tree. For these he went to the then-unexplored mountains of Carolina, gathered them, grew them in his garden at Charleston and then sent them on to France.

He did not again meet with adventures so sensational as those in Persia, but his journal, mere jottings written by lonely camp fires, in pioneer huts, in canoes, is crammed with sketches of our country as it was in the wondrous days of the early Republic. From his diary we get pictures of the lonely cabins, the mighty virgin forests, the torrential streams never yet bridged, over which his horse had to swim; the backswoodsman; his hard-working wife, and their sturdy children; the Indians who sometimes stole his horses and sometimes guided him through pathless forest tracks and always wanted to be paid in rum. Now he slept under the roof of some half-breed trader on the frontier, and now he dined with George

Washington at Mt. Vernon and presented him with some fine fruit trees. He was the friend of Madison and his wife "Dolly" whose courtly manners the Frenchman much admired. And he especially liked Thomas Jefferson, a man of scientific ability to whom he proposed a plan for exploring the continent to the shores of the Pacific. He also laid his plan before General Clarke, the old Indian fighter, when he met him in Illinois, and it is noticeable that several years later Jefferson sent Lewis and Clarke on their great transcontinental trip.

Now we see the tireless Frenchman, who, by his courtesy and honesty, won everybody wherever he went, visiting the orange groves of Indian River, Florida. Now he is shooting the rapids in Northern Canada. He visited Lake Mistassini, still one of the most impenetrable regions of Ungava, and reached at last the shores of Hudson's Bay.

Everywhere Michaux was busy collecting seeds and specimens of flowers and trees. No museum botanist was he, but a true field scientist, one who learned from Nature directly. True, he had studied under the great Jussieu, and followed at the heels of the greater Lamarck, when, as a young farm boy with a taste for horticulture, he had first taken up the study of botany. But the same amount of formal schooling would have been lost on any man who had not the instinct for rare plants. In those days America was still a virgin territory for naturalists. The forests had not been felled nor the game shot off; bears and mountain-lions were as common in North Carolina as raccoons and opossums are now and in Michaux's time caribou in Canada were not worth remarking. As for the botany of our land, it had scarecly been noticed, and Michaux missed nothing.

In France, meantime, a Republic had been proclaimed. Pursuits of peace like collecting plants made no more impression in revolutionary Paris than a cricket chirping in a boiler factory, and Michaux found that no support or money would be given him by the new government. So he set sail for his native land to see what could be done in person. Off the coast of Holland his ship went to pieces, and his diary and much of his collections were lost. Michaux lashed himself to a plank and was washed ashore. When fishermen picked him up he was believed at first to be dead.

His trees which he had sent home from Persia and America had all been destroyed during the wars that were convulsing France, and this nearly broke his heart. Scientists received him warmly, but the government was then in the hands of a military party that intended to waste no money on follies like science. Michaux's salary had not been paid for seven years and his own money was exhausted. However, he was able to join a private expedition of scientists to Madagascar, and thither he went, his heart once more full of hope. He started a new botanical garden on the coast as a receiving station for tropical flowers, but the negroes were so lazy that the impatient man seized the spade and did the work himself under the broiling tropic sun. Heedless of warnings, he worked on until yellow fever overtook him and he died, far from his native France, far from his beloved son who was then travelling in North Carolina. And so passed away the most romantic and adventurous figure in the chapter of American science. It is safe to say that no botanist ever did more for our country in the way of actual original discovery in the field than that daring, delightful wanderer, André Michaux.

POND LILY

L. M. CHACE

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DEPARTMENT of NATURE EDUCATION

Dr. E. Laurence Palmer
Cornell University, Director

Natureless Nature

by E. Laurence Palmer

Not long ago a boy called me on the phone and asked to make an appointment at my office the following day. I made a definite appointment and at the appointed hour the young man walked in armed with a huge roll of wall-paper. He told me that he wished my advice in regard to plans he had just drawn up for a "turtle house". These plans included a dining-room, bed-room, bath-room and living-room for the fortunate reptile. Naturally I was greatly interested in the proposals as presented to me and when asked for advice concerning the dining-room suggested that it would have to be planned to fit the needs of the particular kind of turtle to be accommodated. Evidently the boy had devoted considerable and continued effort in making his plans and I did not wish to interfere in any way. Imagine my surprise, then, when I asked concerning the kind of turtle to be housed, to be told that the turtle had not as yet been captured. In fact, the young man wanted me to help him get a turtle.

A new neighbor boy slightly older than the other called on me within a week saying that he wished me to examine him for the merit badge in reptiles which is awarded by an organization of which he is a member. I went over the list of requirements set forth and the boy seemed able to answer most glibly every question I asked him except one. He could describe a garter-snake perfectly. He could tell about the various types of teeth possessed by snakes but he could not tell how snakes change their skins. I happened to remember that in mowing the lawn which separates my house from the house of this boy I had seen a freshly shed snake skin so I took the young man out to see it. As luck would have it there was a live garter-snake close beside the skin. I picked the snake up and started to hand it to the boy but he refused to take it as he said he "simply could not handle snakes." Remembering that he had just given me a good description of a garter-snake I asked the boy what kind of snake I held in my hand. He hemmed and hawed but was unable to tell me except that he was pretty sure that it was not a garter-snake.

I offer these two experiences as evidence that our nature education program has made a slip somewhere. These boys had been provided with ample reading matter about reptiles but in some way or other this reading matter had not called for the reader to go out and get experiences "on his own." These boys had somehow acquired a desire for a certain type of familiarity with Nature but neither had "the real thing." Each had lost a golden opportunity. They were not fitted to get from Nature itself more than the smallest part of the possible rewards which it offers. These experiences got me to wondering whether or not I myself had not begun to look too much to books for inspiration and information. Ever since I have deliberately set myself to finding in the woodland of my back yard, one new thing each day the like of which I have never seen before. I don't know how long I shall keep this up but I do know that my time has been spent most profitably. I have taken the experiences of these boys and of myself as a theme this month to emphasize that every nature program adopted for school use should insist upon a maximum of first hand experiences. As I write this a chipmunk gathers hollyhock fruits within four feet of my typewriter and I have and am learning from him many things not to be found in books. Within a week a flying squirrel has come down the chimney and disported himself about the living room. I thought he would bite me and so put on gloves but though I have handled him repeatedly since he has never offered to bite. I have learned from a flying squirrel that flying squirrels are gentle, a thing which I did not believe exactly though I had read it in books and had seen the creatures running free.

It is not necessary that one learn these things in an environment which boasts of snakes and chipmunks and flying squirrels. Equally genuine and nearly as interesting experiences may be had with earthworms, house mice or even cockroaches. I visited a Pacific coast high school biology class last Winter during an hour when the pupils were having a lesson on reptiles. This lesson consisted of copying drawings of the skeletons of turtles and snakes from textbooks. Not a living reptile was in the room though two blocks from the school was a restaurant that had Pacific terrapins alive in the window.

We don't need special nature rooms in all of our schools. What we do need is that all school rooms be nature rooms to some extent. There is no excuse for any school room limiting its live stock to the pupils when glass terraria and window boxes are so easily made. I have seen dragon flies and monarch butterflies in the heart of cities but even though these creatures might not be captured easily there will always be cockroaches in the East and fleas in the West so why worry. Look around for yourselves. The material is there. Get it. Let books help you, but don't let them deprive you and your pupils of the joy of learning things first hand.

NURSERY NATURE TALES

Being the Adventures of Toby and Beth, Two Very Little People in the Big World

The MOUSE with WINGS

by Elizabeth K. Peeples

THE EVENING was warm for October. A great golden moon hung low in the eastern sky. Toby and Beth were on the porch.

"It's bedtime. Come, dears," called Mother.

"Oh, let us stay just a minute longer. There's a mouse out here," begged Toby in an excited voice.

"A mouse? Daddy, do go see," urged Mother.

Out came Daddy, quick as a wink. "Where is your mouse?" he demanded.

Toby and Beth were bending over a small object scrambling clumsily along the porch floor.

"I think it's a bird," said fat little Beth. "It was flying around a minute ago."

"Who ever saw a bird with ears and fur? It's a mouse with a rubber cape," declared Toby.

"Who ever saw a mouse fly?" Beth generally agreed with Toby, but she couldn't this time.

Daddy laughed, "You're both wrong," he said. "It's a bat."

"A bat? Then it likes bacon and cakes. Let's feed it," begged Beth.

"Why, what put that in your head?" asked Daddy.

"My Mother Goose Book says,

Bat, bat, come under my hat,
And I'll give you a piece of bacon;
And when I bake, I'll give you a cake,—"

Beth was very much in earnest.

Daddy had set the top of an old cage that the canary no longer used over the bat, so it could not get away, and now he lifted Beth to his knee.

"That's only a funny old jingle, honey bunch," he said. "Bats eat insects. They eat the mosquitoes that like to bite sweet tender things like you and Toby. Bats have mouths like little bags. They fly with them open to catch everything in the way. And did you notice the part of the 'rubber cape' between the hind legs? Bats can fold insects up in that as in a net."

"Does the mother bat carry insects to the little ones?" asked Toby, thinking of the robins.

"No, her wings make a cradle for the little bats. She holds them, while they suck the milk from her breasts."

"That's the way Tabby feeds her kittens," said Toby. "And what does the mother bat do with them when they are not eating?"

"She just hangs them up by their hind feet to a twig somewhere, when she doesn't want to carry them clinging round her neck."

"With their heads hanging down? What a queer mother!" said Toby.

"Oh, that's a bat fashion," answered Daddy. "When it gets colder, all the bats will hunt up caves or hollow trees, or places of that sort. There they will hang themselves up by their hind feet, fold down their wings close to their bodies so that they look quite small, and go to sleep."

"And when will they wake up?" inquired Toby.

"When there are insects flying around again," said Daddy.

"Do I like bats?" Beth asked very seriously. She was puzzled.

"I heard cook say they were dirty," said Toby.

"People think so, but it isn't true. The bat uses its rubber cape, as you call wings, for a wash cloth, and keeps itself very clean. And I think a creature that eats the mosquitoes, that like to eat you, is your friend, eh Beth?" Daddy kissed her round cheek.

"Then we'll let the bat go to catch some more mosquitoes," nodded Beth drowsily.

Daddy lifted the cage, and like a flash the bat was gone, its wings showing dark against the moon.

Van Bourgondien

There is Still Time to Plant Dutch Bulbs

YOU may have our 1927 Bulb Catalog on request. The life-like color illustrations of Tulips and the accurate descriptions of our Tulips, Daffodils and other bulbs, will assist you in a wide choice of varieties. There are special sections for those interested in Dutch bulb novelties. Our Daffodil bulbs are the finest we have ever seen grown either in Holland or America. The 1927 crop of Tulip bulbs are also unusually fine. Below we offer two special collections designed to give you a real feast of colors for your garden next spring.

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Glory of Sassenheim (*Bicolor*) Perianth white, trumpet golden yellow	2.00	15.00
Golden Spur (*Yellow Trumpet*) Medium size. All yellow. Early	1.50	11.00
Laurens Koster (*Poetaz*) white perianth, delicate orange cup	$1.50	$11.00
Ornatus (*Posticus*) Snow white perianth, red eye. Early	1.35	10.00
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Queen of the North (*Leedsii*) All white. Very fine and free	1.75	12.00
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5 Bulbs each of the above 12 varieties (60 bulbs) $ 7.50
10 Bulbs each of the above 12 varieties (120 bulbs).. 14.00
25 Bulbs each of the above 12 varieties (300 bulbs).. 32.50
100 Bulbs each of the above 12 varieties (1200 bulbs).. 125.00

We guarantee all our bulbs whether grown in Holland or America

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A tulip border as shown above will, with ordinary garden care and culture, last for several years. The bulbs are really "flowers in embryo." They will bloom for everybody even in poor soil, though in good garden soil, the flowers will be larger and more brilliant

Plan NOW For Spring Flowers

IF you would enjoy the graceful Daffodils, the lively Crocuses and stately Tulips that transform our spring gardens into veritable fairylands, then you must plant the bulbs for these flowers now. Raising flowers from bulbs is easy and a pleasant hobby that need not be expensive.

A Charming Tulip Border for Only $10.00

15 Bulbs each of 12 Choice Sorts—180 Bulbs in All!

During the last decade Zandbergen Bulbs have been perpetual Blue Ribbon Winners at Flower Shows throughout the country. The varieties in this selection all bear extra choice flowers of great substance and beauty.

John Ruskin—The salmon-rose, edged yellow, Cottage Tulips shown in foreground. Doz. 80c; 100 $5.50.

Turenne—Purplish brown with yellow margin. Doz. $1.35; 100 $10.00.

Dream—Pale heliotrope Darwin. Doz. 65c; 100 $4.50.

Eclipse—Deep rich glowing blood red. Doz. $1.60; 100 $12.00.

Pride of Haarlem—Rose-carmine Darwin. Doz. 60c; 100 $4.00.

Mrs. Moon—Golden yellow Cottage. Doz. 70c; 100 $5.00.

Princess Elizabeth—Deep pink Darwin. Doz. 70c; 100 $5.00.

Clara Butt—Finest salmon-pink Darwin. Doz. 55c; 100 $3.50.

Grenadier—Red with yellow base. Doz. 90c; 100 $6.00.

Faust—Dark satiny purple Darwin. Doz. $1.00; 100 $7.00.

Bronze Queen—Soft buff Breeder. Doz. 65c; 100 $4.50.

Prince Albert—Glowing mahogany-brown, shaded dull bronze, Doz. $1.15; 100 $8.00.

Send no money—unless you wish, in which case you may deduct 5% cash discount.

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ZANDBERGEN BROS., *"Tulipdom"* Oyster Bay, L. I., New York

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NATURE NEWS AND VIEWS

Forest is Memorial

As a memorial to his wife, Mrs. Sarah Lewis Guthrie, Indiana clubwoman, William A. Guthrie has presented to the Nature Study Club of Indiana a tract of nearly sixty-two acres to be maintained as forest preserve and wild life sanctuary. The tract is near the Guthrie home at Dupont, Indiana. It will be maintained by the Club in accordance with the terms of the deed, which gives the land in order that it may be used for the study of the native timbers of the state. The gift was accepted in behalf of the more than four hundred members of the Club by its president, Charles J. Buchanan.

Modern Salt Licks

At the Bear Mountain Park, which is part of the Palisades Interstate Park, the wild life has increased very fast in the last few years, writes Charles A. Johnson. It was reported lately that several deer had been killed on the roads by automobiles. A number of watchers were stationed on the roads at night and the deer were seen coming out of the woods. They would walk along the road and from time to time would stop and lick the pavement. On investigation it was found that they were licking up the salt that had formed from the drip of the ice cream wagons supplying stands around the park.

A Fine Work

Violet L. Findlay, supervisor of Nature Study at Wilmington, Delaware, points out that the future of places of natural beauty in cities rests in the hands of the children of the present generation, in making a report on accomplishment in her city. The work that is being done in Wilmington is outstanding in this country and enjoys the cooperation of the schools, the park authorities and the citizens generally. Bird houses, winter feeding stations and generally education looking to the conservation of bird life is being most effectively carried on.

Mr. Fuertes Passes

Art and Ornithology have suffered a great loss in the passing of Louis Agassiz Fuertes, fatally injured when his automobile was struck by a railroad train. This sudden tragedy left unfinished several activities in which Mr. Fuertes was engaged, including his report of the Abyssinian expedition of the Field Musuem of Natural History. Livingston Farrand, president of Cornell University, where Mr. Fuertes was on the faculty as lecturer on Ornithology, declared that "American art and science have suffered irreparable loss." Mr. Fuertes was the painter of many illustrations for books on birds as well as habitat groups for museums, and his eminence as an ornithologist was equal to his ability to reproduce the birds in color.

Botanic Garden

Equipped with an endowment of 3200 acres of land in Mandeville Canyon, fifteen miles from the busi-

ness center of Los Angeles, work is being carried forward on the establishment of the California Botanic Garden. Dr. E. D. Merrill of the University of California has charge of the task. Plant life from many parts of the world is to be propagated with the idea of improving and adding to California's crops, plants and decorative shrubs. It also should become a showplace of rare interest and beauty.

Park Conference

Conservationists and others will gather in Cincinnati October 18 to 20 to attend the third regional conference on State Parks for the Ohio Valley. The meeting will be under the auspices of the National Conference of State Parks and is open to all who have an interest in the conservation program represented in the setting aside of state parks and forests. The first two days of the conference will be devoted to discussion and addresses with a short trip through Cincinnati's parks and the third day will be given to an all-day trip to Fort Ancient, the largest prehistoric earthwork in North America. The Hotel Arms, Cincinnati, will be the headquarters of the conference. Details may be obtained from Morten Carlisle, secretary, 71 East Hollister St., Cincinnati.

Landscape Lectures

What is it about the landscape, distant or immediate, that is a source of enjoyment? How can the best effects be obtained in the landscaping of your home grounds, be they large or small? There is an insistent demand for answers to these questions by individuals, by members of garden clubs and outdoor lovers generally. We are interested to learn that Mr. Bradford Williams, executive secretary of the American Society of Landscape Architects, 9 Park Street, Boston, Mass., has evolved a lecture illustrated by motion and still pictures to answer just these questions. His treatment of the subject is decidedly novel and at the same time highly practical, and the lecture fits admirably into many programs.

About Chameleons

Apparently one of the most read short articles in Nature Magazine recently was that in the June issue about the chameleon pets of Dr. George W. Smith of Peoria, Illinois. Dr. Smith and this office have received numerous letters, many of them from owners of chameleons, also. Several of these letters have asked for advice on how

Gorgeous Springtime Blooms

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Fall is the time to plant bulbs for a resplendent springtime garden. For your consideration a selection of a few of the outstanding varieties of Darwin, Cottage and Breeder Tulips are listed below. All bulbs imported direct from Holland. Carefully selected for largest sizes only.

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1200 Bulbs—100 of each		49.00
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Breeder Tulips	15 "	" " 3.50
Cottage Tulips	12 "	" " 3.00
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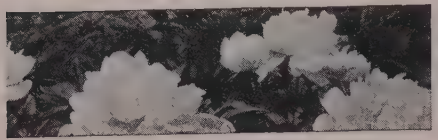

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best to care for one of these little fellows during the winter in cold climates. Dr. Smith gives this advice. In climates where insects are no longer available as food, he suggests using a small fly trap baited with water to catch roaches and keeping a small amount of powdered sugar in the chameleon's cage to provide additional internal heat. As a nest he suggests getting the nest bird dealers sell for canaries and lining it either with loose sheep's wool or red flannel. This warmth and the food proposed should see these pets through the winter.

Heilner Expedition

Specimens of the great Alaskan brown bear are being sought for the American Museum of Natural History by Van Campen Heilner, who has left for the Aleutian Islands. Mr. Heilner is equipped with cameras in order that he may bring back incidental detail that will serve to make the eventual habitat group in which the specimens will be used accurate as to natural surroundings.

To Save Musk-Oxen

By setting aside a sanctuary in the valleys of the Hanbury and Thelon Rivers east of Great Slave Lake in the Northwest Territory, the Canadian Government has taken important steps toward the saving of the musk-oxen. The sanctuary comprises about 15,000 square miles in which there are known to be numbers of these unique animals.

Owls to the Rescue

Lord Howe Island in the South Seas has been beset with an army of rats, particularly bothersome to the eleven inhabitants of the island. Poison and cats have failed to execute the rodents and recently a number of owls were shipped from San Diego to wage war on the rats. Let us see, didn't some powder company list the owls as vermin and urge their extinction?

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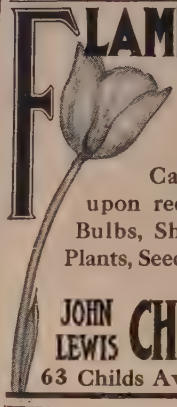

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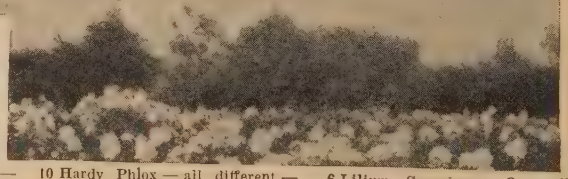

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Flicker	Wood Thrush
Goldfinch	Red-eyed Vireo
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Near Moon Lake in the Uintah Mountains of the Ashley National Forest there is a remarkable merging of species of trees, where citizens of the forest that normally are found on the sun-parched plains and on the heights near timber line, grow together. In view of the scientific value of this natural arboretum, the Forest Service is making it accessible by trails, will make other improvements and keep it permanently for visitors and students.

A Nest in Ashes

Writing in the *Nature Notes* of Yosemite National Park, D. D. McLean, one of the Nature Guides, tells of arriving at Glacier Point and starting to set up the tent for the summer season. The camp stove, covered with canvas, had been left on the platform, and, once assembled, Mr. McLean began to lay in it a fire. As the stove lid came off he was greeted by a hissing note, and peering down into the fire box what should he find but a short-tailed mountain chickadee sitting on a nest and seven eggs. This home was hollowed out in the ashes and lined with the stuffing of a mattress or quilt and hairs. The fire was not built.

Nature and Tourists

Just as many newspapers are responding to public demand and running Nature columns, various magazines are including here and there Nature articles. One of these is *Touring Topics,* attractively printed monthly of the Automobile Club of Southern California. Its August issue emphasizes Nature, particularly with a fine article by G. Rayson Brown on the miniature world of insects that can be found in the back yard.

Bird Stone Cutter

This one comes from "Jim" Borland's Nature column in the Franklin, Pa., *News-Herald,* and concerns a persistent flicker. In the local cemetery there is a headstone of dark sandstone, carved to imitate wood. About a year ago the flicker paid a compliment to the art of the carver by starting a hole in the stone, clinging to the raised lettering on it as he worked. A year's intermittent toil has resulted in a hole about an inch deep and a bit more than an inch in circumference. The bird is still at work.

A companion story comes from

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The several de luxe cruises to South Africa this coming winter have already booked over 2,000 Americans. Write for free booklet, "In the Track of the Sun", or send 12 cents (to cover postage) for fully illustrated travel booklet.

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Jane A. Evenson of Silverton, Oregon, who sends a clipping from the *Oregonian* of Portland. The story is about a guest of the Multnomah Hotel, Mr. W. R. Buckner, who arrived with baggage including a telephone pole in four parts. It was, indeed, a serial story of busy woodpeckers who had bored many holes in the pole, stuffed them with acorns and established themselves a fine food supply for winter. Ask Mr. Buckner, who comes from Omaha, Nebraska, saw the pole, studied it, and then paid the expense of replacing it in order to get it for himself. He is taking it back to Omaha to use in a thrift campaign to be run by his publishing house. Certainly the woodpeckers knew how to save for a rainy day.

Hiking the Smokies

All of our members who live within visiting distance of Knoxville, Tennessee, should know of the Smoky Mountains Hiking Club. This organization has recently brought out a fine program of hikes in these beautiful mountains, and they are an invitation to the Great Smokies. Anyone interested can obtain details from Brockway Crouch, 614 South Gay Street, Knoxville.

Save Texas Flowers

Mrs. Clarke Burr, president of the Texas Bird and Nature Study Club, reports excellent results obtained from a poster contest in the Dallas Schools against thoughtless picking of wild flowers. The club sponsored the contest and gave prizes of bird baths for the best posters. The posters were exhibited in show windows and much public education was accomplished.

Dr. Hall Resigns

After a service of twenty-nine years as secretary of the American Scenic and Historic Preservation Society, Dr. Edward Hagaman Hall has resigned to become secretary of the Municipal Fine Arts Commission of New York. His stewardship has been one of distinction and accomplishment. Dr. Hall is succeeded by Raymond H. Torrey, field secretary of the National Conference on State Parks.

In The Wren House

Leon P. Thomas of Drexel Hill, Pa., always replied in the negative, he says, when asked whether young wrens return to the nesting box at night. Now

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he qualifies the negative,—but here is his report on his wren experiences of the June past:

"The racket going on in one of our wren houses was daily becoming louder and there was every indication that at any time now, the young ones would be making their test flights.

"On Saturday morning, instead of the incessant chatter coming from the interior of the box it seemingly was coming from all directions in the high hedge in the rear, and I knew the young were on the first stage of their journey in this big, big world.

"It had always been my experience with wrens that once the young left the nest, the mother soon took them to parts unknown and little opportunity was offered to study them. Happily, this little mother is content with her present surroundings and they have been with us now for four days.

"It has been my privilege to watch them daily and the energy and patience of the parent bird is almost beyond belief. On the first day (Saturday) by short flights and jumps, the little ones travelled a distance of 75 feet from their former home, through hedge and shrubs, where they rested for the night. The following morning (Sunday) by nine o'clock, they had returned by a rectangular course, a distance of 150 feet and during the remainder of the day made an additional fifty foot trip to return at dusk to a small cherry tree in the yard. In this tree was another wren house, unoccupied, and on the roof of this house, with much scolding and many a moth, the mother finally corralled all the young ones. I was now able to count them—there were four. There I expected to see them settle for the night, for I was sure after that Sunday picnic the whole family was ready for bed. What was my surprise then, to see the mother go in the house, poke her head out and 'say something.' She must have said something for I was soon convinced by her actions that she was going to get the family in the box. It was quite cold and windy on that evening and she no doubt felt the need of shelter. Sure enough, one finally slid down the side and entered the hole —then another. The third and fourth found more difficulty and there was many a tumble to the ground and a scampering up the tree again before all four were safely housed. It was during this tedious procedure that Daddy wren, whom I had not noticed all day, appeared and seemed to stay inside the house to keep the young ones there, as one by one they entered, while the mother remained outside.

"The same programme was followed the next day. After a day in the shrubs and hedge, the young were led back

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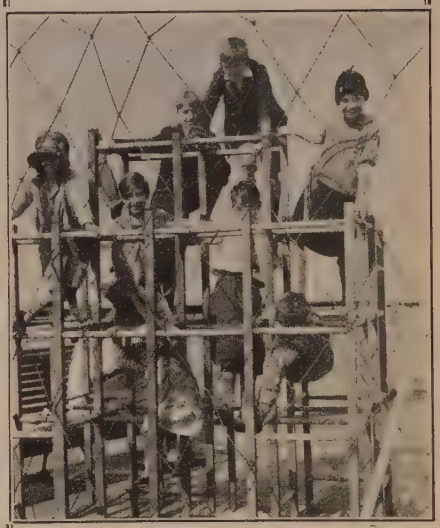

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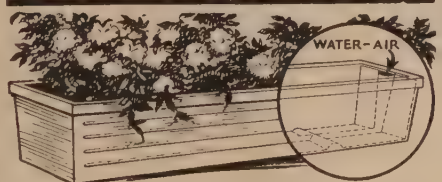

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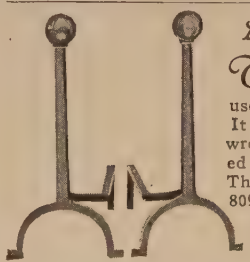
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to the box for the night. It seemed this evening that number four must have heard something of 'Plucky Lindy'. He had made several successful flights from the foot of the hedge to the tree, some twelve or fifteen feet, and was disposed to take the air regardless of weather conditions. Once, while he was on the roof of the little house, the mother bird rushed at him and pulled him off, landing him on the ground. This was the first time I had seen other than moral suasion used.

"On the fourth day out, they did not return to the box but were seen flying among the branches of the taller trees. A few days more and they will be able to make the highest branches."

Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature

QUESTION: *I have had a young mud puppy for three or four weeks. He has eaten nothing during that time. I have dangled little pieces of meat on a thread, which has worked well with newts in the same aquarium, to no avail. I shall be very grateful if you will tell me how to feed the puppy—Sister M. A.*

ANSWER: In a state of Nature these creatures live on small fishes and fish eggs, crawfish, aquatic insects and worms. In captivity they are usually fed earthworms and raw liver.

QUESTION: *In the February 1927 number of Nature Magazine is a photograph of hepaticas beside a log and in the center of the photograph is a leaf of another plant of which I am very anxious to learn the name. It is a single oval leaf found in the woods in winter time. It has a bulbous root.*—F. B. Z.

ANSWER: The plant shown in the hepatica picture is putty-root, *Aplectrum spicatum*. It is also called Adam and Eve, from the two corms underground. It has rather unattractive dingy flowers, and the single

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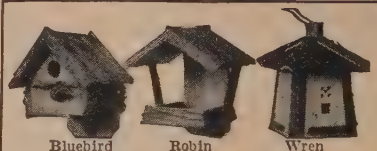

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QUESTION: *Do antelopes have dewclaws? —W. J. R.*

ANSWER: The antelope differs from the deer in not having dewclaws.

QUESTION: *Our biology class is interested to know if the snake's tongue is used for hearing—K. A.*

ANSWER: It has been proven that most, if not all, snakes are unable to hear air-transmitted sounds, though they can detect sounds transmitted through solids.

QUESTION: *I wish to know what two-winged flying animal flies the fastest.— F. M. N.*

ANSWER: The fastest creature of which we have read is a fly of the size and general appearance of a bee, which according to the Scientific Monthly (Vol. 22, p. 309, 1926) flies at an estimated rate of 400 yards per second.

QUESTION: *Years ago we had a big flat stone leading into the garden. Sometimes at twilight swarms of what seemed to be winged ants came from under the stone and at the same time a dozen or more toads would appear, unroll their funny tongues and snap up the ants. What about winged ants?—E. B. J.*

ANSWER: The ants that we ordinarily see are the workers, which are wingless, but the breeding males and females have wings, and those you saw were emerging for their nuptial flight. The males die after this but the females live and lay the eggs that perpetuate the colony.

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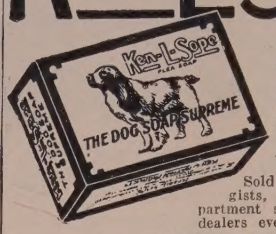

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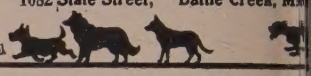

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"FLOODS, FORESTS *and the* FUTURE"

Important and Significant Publication of the American Tree Association Arouses Widespread Interest and Enjoys General Use

WHEN the raging Mississippi was at its swollen height and homes and wealth were being swept before the torrent, Mr. Charles Lathrop Pack, president of the American Tree Association, pointed his finger to the timber-shorn headwaters of the streams that feed the Father of Waters. "Look to your forests," he urged, and added that in their indiscriminate sacrifice lies an important part of the answer to the problem of flood control. In a word, he said that the waters that made the rivulets, the brooks, the streams and the rivers, finding no fetters of forest cover, no absorbing forest soil into which to seep, rushed more rapidly to the great river, lending it together and at once their massed force.

Mr. Pack and the American Tree Association were not, however, content merely with these words of admonition. Immediately work was gotten under way to gather the best information available from sources of authority. This data has been embodied in a booklet of thirty-two pages with the title, "Floods, Forests and the Future". It is published and distributed free by the American Tree Association.

The issue that is now drawn is that of public education and legislative information. To this end this booklet is being distributed to members of Congress and State Legislatures, to Chambers of Commerce and Boards of Trade, to conservation organizations, to those whose influence or professional qualifications connect them with the task of flood control, and to individuals generally who have a sincere and constructive interest in this great issue.

"Floods, Forests and the Future" has met with an immediate and enthusiastic response. It has been hailed by the Press and by others who have received it. Judging from this response it is certain of being a valuable aid in the steps that will be taken this Winter to meet the flood problem of the future.

In a letter to Mr. Pack, Herbert Hoover declares, "I am in favor of trees; also of reforestation. The floods of the Mississippi might be ameliorated by it but reforestation is of far greater importance than that, and in any event they cannot wait for trees to grow up even if this were a contributory remedy. But in any event, I am for the trees".

"Floods, Forests and the Future" opens with a foreword by Mr. Pack, printed in part herewith. It then presents an important statement by Raphael Zon, Director of the Lake State Forest Experiment Station of the United States Forest Service, who discusses the facts of the relation of the forests to floods. From another point of view this question is taken up by another forester, Ward Shepard of the United States Forest Service.

As evidence of what has been done and can be done, data is presented in concise form on reforestation done in other countries specifically to check floods and erosion. This information is supported by report on specific experiment and research done in Pennsylvania, presented by Joseph S. Illick, State Forester of that State, and E. F. Brouse. Finally the booklet gives brief summarizing statements from Colonel William B. Greeley, Chief of the United States Forest Service; H. H. Bennett of the United States Bureau of Soils; Walter Parker, economist, and some of the leading periodicals in the United States.

Thus "Floods, Forests and the Future" presents in authoritative and readable form the evidence for the forest in its relation to preventing such disasters as the Mississippi flood. It will be sent on request by the American Tree Association, 1214 Sixteenth Street, N. W. Washington, D. C.

SHALL WE PREVENT FLOODS?

By CHARLES LATHROP PACK
President, American Tree Association

"IT IS *time to act.*

"In carrying forward all great human endeavors there is a time for taking thought, a time for formulating plans, and a time for action. Without the last the first two are sterile.

"Today we are confronted with the tragic aftermath of one of the most gigantic defeats that engineering science has ever suffered. A great river arising in its angry wrath has broken our man-made levees as a summer's shower carries away the mud toys of a little child. For forty years engineers have told us to put faith in levees. For forty years, in spite of failure after failure, we have put not only faith, but money. Probably we shall have to devote many millions more to this form of river development, but it is folly longer to depend for flood protection on levees alone.

"The problem of the Mississippi is far too huge and too inextricably bound up with our national welfare to approach from anything less than a national viewpoint. It is a problem to whose solution we must bring not only the best of engineering skill, but also the best knowledge and scientific attainment in the fields of forestry, range control, and soils management. We have got to formulate a vast, thoroughly correlated scheme wherein the engineer, the forester, and other experts shall give their best toward devising effective means of taming once for all the turbulent Father of Waters.

"Here in America, and for the past twenty years especially, there has been a great deal of loose thinking and irresponsible writing about the influence of forests on stream flow. It would be futile for even the most skeptical longer to maintain that a forest cover is without important effect on surface run-off, erosion and the regimen of rivers. Such gross misstatements are amply refuted by history, by scientific investigation, and by common sense. . . .

"Already a wealth of forest facts exists pointing to the moderating action of forests on floods and to the deterring effect on erosion. And, after all, it is erosion that furnishes arms and ammunition to flood waters. Not water, but solid matter, is the destructive stuff that floods are made of. . . .

"The problem of flood control seems to me to require a three-part solution.

"First, I should plead for a restoration to forest conditions of all those portions of the land suited for practical forest growing that are today destructively and wastefully washing away through lack of trees.

"Second, the application of the very best engineering technique we possess for the building of levees, storage dams, spillways, or, if need be, a combination of all these.

"Third, we need to correct and regulate the destructive grazing that causes millions of acres east of the Rockies to erode and flow away.

"The Mississippi has brought to us an obligation for action that must be squarely and immediately met. How else shall we justify our stewardship to the generations that follow?"

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Transparent—Always see exactly how much ink you've got.

Unbreakable—You can even *step* on it without injuring it.

Smoothest Writing Pen You Ever Saw—Big, solid 14-Karat gold point, tipped with the finest iridium.

Self-Filling—The easiest of all pens to fill.

Holds 3 to 4 Times More Ink than Any Other Self-filling Pen.

And Remember—The materials and workmanship are guaranteed to be equal or superior to those found in *any* other pen, whether sold at $7, $8.75 or more.

WITH a few strokes of a pen you can instantly short-circuit a lot of expense. This is made possible by a simple, easy and very quick sales method successfully established three years ago by the Postal Pen Company.

Your name on the coupon below eliminates jobbers' discounts, salesmen's commissions, retail discounts—two-thirds of the "profits" that a pen must yield when sold in the ordinary way.

But that isn't all. It brings you, direct from manufacturers' factory, the pen with hundreds of thousands of users who consider it superior to any fountain pen, regardless of price. Its exclusive patented features put the Postal Pen in a class by itself.

The One Reason

Figure this out for yourself: There's just one reason for carrying a fountain pen. You can't carry an inkwell around in your pocket or hand-bag. You want a fountain pen so that you will always have a smooth, beautiful, easy-flowing writing instrument that carries its own supply of ink. When it is dry, it is no better than an old-fashioned steel pen until it is filled again—the more ink it holds the more real *Service* it renders you.

Then compare the following features of the Postal Pen with any other pen at any price!

Postal—the same size as other fine fountain pens—*actually holds three times more ink!* Has three times the usual inside-of-barrel capacity. Three times as much writing service.

3 × 3 = 9

To carry this much ink—to be able to write this long without the trouble of refilling—you would need 3 ordinary fountain pens. And to get ordinary pens of similar unexcelled quality, you'd have to pay 3 times as much as you pay for a Postal Pen. 3 times as much service—and a fine, beautiful pen absolutely guaranteed equal in quality and workmanship to pens costing 3 times as much—3 times 3—9 times as much for your money when you buy a Postal Pen!

And one of the biggest features of all is the fact that the Postal Pen Barrel is actually transparent. Keep it clean and you can always see, right through the barrel, exactly how much ink you have. Other pens run unexpectedly dry. Postal never does—you always know when to re-fill it.

Finest iridium tipped solid 14-karat gold point—the same quality as in the costliest pens. Absolutely guaranteed. All of the materials and craftsmanship are absolutely guaranteed to be equal or superior in quality to those found in any other pen sold at $7, $8.75 or more.

Another Great New Feature

But how will we know exactly what kind of point you need? Our experts have been working with graphologists—handwriting experts—for months, and now they can tell **from your own handwriting** exactly what type of point will suit you best. Just as an expert, after making an examination, can tell a person who needs glasses exactly what kind of lenses he should have. **You wouldn't try to select a pair of glasses from a little corner store with only a few to choose from!**

Costs Only

$2.50

Thirty days' free test! So satisfactory has this greatly improved new method of selecting a pen point proved that we will let you use your Postal Pen a full month and then return it and get your money back if you don't find it the most satisfactory pen and point you ever used in your life.

Don't wait until tomorrow! Mail the coupon today—right now! If the signature space isn't large enough for you to write in your natural style, write on the margin of the page so that our pen point experts can select from a gigantic stock the point exactly suited to your natural style of writing.

Send no money—merely deposit $2.50 with the postman when he delivers your pen, and then try it thirty days before you even decide to keep it! **Mail coupon now!**

POSTAL PEN CO., Inc.
Desk 285, 41 Park Row, New York City

Please send me one Postal Reservoir Pen, and five special Premium Postcards which I may use, give away, or dispose of at 50c each. I will pay $2.50 upon receipt of the pen. If after 30 days' use I desire to return the Postal Pen, you agree to refund purchase price. Send size checked here.....Men's size.....Women's size.

Name.....

Address .....

City.....*State*.....

And FREE with each Postal Pen you receive absolutely free, 5 gold premium post cards, each worth 50 cents on the purchase price of other Postal Pens or Postal materials.

Postal
RESERVOIR PEN

POSTAL PEN CO., Inc. 41 Park Row, Desk 285, New York City